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Amateur Televison Quarterly

Results ATV Contest 2008
KC5SAS ATV Community Service At LSU
QRO Video Modulator
Making PC Boards At Home - Part 2
Build 1.2 GHz Tranceiver Using Comtech Boards
And More

P. C. Electronics 2522 Paxson Lane Arcadia CA 91007-8537 USA

Tel: **1-*626*-447-4565** m-th 8am-5:30pm pst (UTC - 8) Tom (W6ORG) & Mary Ann (WB6YSS)

Email: ATVinfo @ hamtv.com Web: www.hamtv.com

PC ELECTRONICS

See the Fun ATV applications at www.hamtv.com!

Antennas, R/C, Balloons, Rockets, ARES/RACES application notes, repeater design, DX and more

RTX70-1s 1W ATV 70cm ATV Transmitter

RTX70-1s 7.4x4.7x2.2", 11 to 14Vdc @ 500mA....**$399**

Plug & Play ATV with this 4/5 channel ATV transmitter at the home station, use for portable or even at a repeater site. Switch select 426.25, 427.25, 434.0 or 439.25 MHz. 421.25 MHz repeater TX on special order. Adjustable sync stretcher for driving DEMI 7025PA or Mirage D26N amps. RF detected Video monitor output for better adjusting the video gain and seeing what you are actually putting out. Switches antenna and DC to TVC-4s downconverter in reeceive.

Click on the model number on our Products and Prices web page for data sheet and application notes

http://www.hamtv.com 10/2008

New Lower Noise ATV Downconverters

.4 dB NF HJ-Fet preamp stage and a GaAs Fet mixer, 15 to 25 dB gain for a low system noise figure. The 5 switch selectable ATV channels have no drift and right on channel every time you turn it on in hot or cold weather because the synthesized local oscillator is crystal locked. AC/12Vdc power supply included.

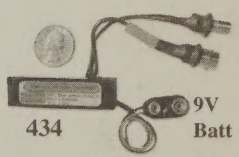
TVC-4s 420-450 MHz band **$149**
421.25, 426.25, 427.25, 434.0, 439.25 MHz to TV channel 3 or 4

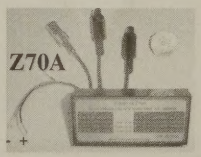
TVC-9s 902-928 MHz band **$159**
910.25, 911.25, 913.25, 919.25, 923.25 MHz to TV channel 3 or 4

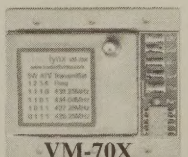
TVC-12s 1240-1300 MHz band **$159**
1241.25, 1253.25, 1265.25, 1277.25, 1289.25 MHz to TV channel 7 or 8, channel 3 on special order

ATV Antennas - We stock or drop ship **Old Antenna Lab**, **Directive Systems**, **Diamond** and **Comet** ATV antennas. See our Products and Prices web page.

We Stock the 70cm Videolynx Transmitters



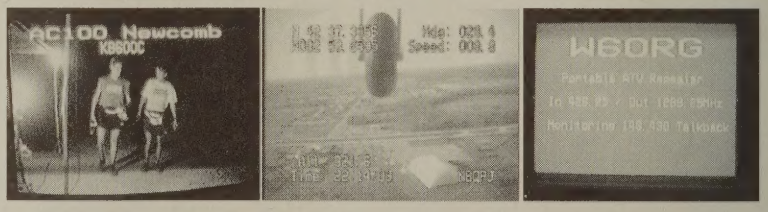




434 - 434 MHz 50-100 mW, video only, 9Vdc @40ma.....**$99**
Z70A - 50-100 mW, audio & video, 9Vdc @ 250 ma....**$149**
4 frequency 426.25, 427.25, 434.0, 439.25 MHz
VM-70X - adj up to >4W, audio & video, +11 to 14 Vdc @ 1A
4 frequency 426.25, 427.25, 434.0, 439.25 MHz **$199**

VIDEO IDENTIFY

with an Intuitive Circuits Video Overlay Board



These in stock boards insert in the video line between your camera and transmitter for home, repeater, R/C or public service events. All have non-volitile memory. 8 to 14 Vdc @ 80ma, board size 2.5 x 3.5".

OSD-SA program characters with the 4 on board buttons.....**$119**
Best for home or when overlay text is not often changed.

OSD-GPS program your call plus input data from a GPS rec.....**$119**
Best for R/C, Rocket, Balloon or vehicles with GPS.

OSD-PC program screen characters from a PC computer.....**$139**
Best for Repeater ID or when text is often changed or no camera.

Hams, download our ATV catalogue and browse the most complete ATV web site - AM, FM, 70cm to 10GHz. Check out our *New in 2008* & *Specials & Surplus* web site pages regularly!

If You Move

Please send us your NEW ADDRESS! We pay 70 cents for each returned ATVQ. And we are usually nice and send another copy to your new address which costs us $1.29. Please help us from having to do this. Thanks!

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Amateur Television Quarterly

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October 13, 2008
SpaceCam1 SSTV running on ISS

We have a new Successful Amateur Radio project on board the International Space Station called SpaceCam1 (a JPG imaging project).

Congratulations to everyone at MarexMG, Silicon Pixels, ARISS, NASA and at the Russian Space Agency for making this project successful. And special thanks to Sergej Samburov RV3DR.

We have Images!

On Sunday October 12, ISS commander Sergej Volkov activated the MarexMG SpaceCam1 Amateur Radio project from the International Space Station.

This project will allow Amateur Radio operations and Short Wave listeners around the world to decode images coming directly from ISS.

The International Space Station crew activated the project for a few hours on last Sunday. Amateur Radio operators in a dozen different countries were able to receive and decode these images. The tentative plan is to make the project available for Richard Garrotts mission this week. Garrott will have the opportunity load images onto the SpaceCam1 laptop and place the systems into Slide-Show mode. This mode will send a new image to earth every 5 minutes. Amateur Radio stations monitoring 145.800 FM will be able to decode these JPG images in real time

For details on how to receive these images, please go to the MarexMG web page
http://www.marexmg.org/fileshtml/howtouseiss.html

Lists of current images have been posted at:
http://www.amsat.com/ARISS_SSTV/index.php

Previous MarexMG images from Space Station Mir
http://www.marexmg.org/imagessstv/fulllist/

Miles WF1F **www.MarexMG.org**

ATVQ

SSTV History

I was wondering if you can help me with some publicity. Being very interested in Slow Scan television, especially it early to mid ages (70s-80s) I decided to start working on creating documentary film about it. My wife does professional video editing and agreed to help. Now I am trying to get in touch with as many people who were involved in SSTV at that time. I am looking for memoirs, stories, audio and possibly video recordings. Also I would like to cover and film as many kinds of equipment that was used for SSTV as possible. I collected some including all Robot units (except Robot 300 - I gave up on this one, it probably does not exist any longer). All of the Robots are restored and fully operational. I would like to find non US made commercial and homemade equipment too. If someone has anything boxed in their garages and is willing to donate, let me borrow for filming or even sell (at a very reasonable price - as this is a hobby project and on extremely limited budget :-) I will be grateful. All and any help is appreciated.

Thanks for reading and may be considering,

73 de Sergei KD6CJI (ex RA4LBZ) - **kd6cji@mac.com**

ATVQ

ATV Contest 2008

By: ATVQ

Already the ATV Contest for 2008 is over. I hope that those participating had fun. I am pretty sure they did.

ATV Contest - 2008 - Home			
Rank	**Call**	**MILES**	**POINTS**
1	KA9UVY	17081	40958
2	NR8TV	7188	16340
3	N9XHU	5283	13330
4	WB8LGA	5062	11256
5	W4HTB	3728	7456
6	WU8O	2714	5190
7	KC0OW	1473	2946
8	WB8TGY	611	1222

ATV Contest - 2008 - Mobile			
Rank	**Call**	**MILES**	**POINTS**
1	KC9BIE	821	1642

KA9UVY SOAPBOX:

MY Equipment list:

70 cm :

TX = PC Electronics exciter+Mirage D1010+GS23B Final amp = 420w AVG video output.

RX = PC synthesized and tuneable downconverter with 70 Mhz (if) output with 70 Mhz adjustable saw filter.

ARR 70cm preamp(in shack) and ARR 70 MHZ amp for distribution. Demodulated by IC-7000 HF/70cm Multimode Transceiver for carrier detect and band scope and Samsung 13" TV with electronic fine tuning for video.

Antennas = 4 Directive Systems DSFO-25 ATV's stacked @ 130 feet fed with Andrew LDF-5 and LMR 600 Ultraflex for rotor loop.

TX/RX switching via Tohtsu CZX3500 Relay.

23 cm:

TX = PC Electronics modified COP FM exciter + DEM 3watt amp+DEM 20 watt amp attenuated to dive a KJ6KO 70 watt amp Final output 45 watts

RX = Bensat adjustable (if) bandwidth sat rx with DEM 23cm preamp (in shack) followed by 2 gain blocks. Samsung 13" monitor.

Antenna: Directive systems 55 el. loop yagi @ 126 feet fed by Andrew LFD-5 and LDF-6

TX/RX switching via Tohtsu CZX3500 Relay

This is the best I have ever done during the summer contest and I believe there are several factors that helped out a great deal. First and foremost is the activity level was very good this year with many 3 peat contacts in the log.

Also this is the first year since the 4 bay array has been up when I actually experienced a 3+ day opening. The opening that came at the end of July and lasted into August provided many exciting contacts including my first success on 1.2 FM TV with Ohio stations W8RVH and W8ZCF and a 1st time 70cm contact with WB8TGY in Michigan who was only running 10 watts!

The band also was open West many days during the contest from here and that gave me a 1st time contact with KCØOW in Oklahoma and a second exchange with my most distant station ever worked K9KK in Norman OK (first 500+ miles loggings ever during a contest for me).

Another 1st time QSO with KCØEMK in Udall, Kansas while also providing me with my best 3 peat ever during a contest working KCØHFL in Wichita KS @ 462 miles all three months! Bob and I actually worked 4 times this summer but only 3 counted for the contest so the West path was just super this year.

The other contributing factor I believe was that coordination has never been better. The camstream was a great benefit with it's real time chat and 144.340, 3930Khz were also used. I even employed the telephone to get a few guys on and the use of those 70 Mhz narrow (if) filters was wide spread this year resulting in P-1's when only a sync bar would have been visible.

There were also many almost contacts, those 1-ways that break your heart but still add so much fun and excitement. A few worth mentioning were the 6-1/2 hours spent trying to work N9UQD/5 portable in Mountain Home, AR, only to come away

KA9UVY

STATION WORKED	REPORT SENT	REPORT RECEIVED	UTC	DATE	FREQUENCY	Grid Sw.	Miles	Points
NR8TV	P1	P1	0039	06/01/08	70cm	EM89hh	385	610
N9XHU	P1	P1	0040	06/01/08	70cm	EM59et	113	226
W9ZIH	P1	P1	0138	06/01/08	70cm	EN51mv	252	504
W8ZCF	P2	P3	0147	06/01/08	70cm	EM79tb	248	496
AA9MY	P2	P1	0309	06/01/08	70cm	EN50fm	158	316
WØDQY	P4	P5	0340	06/01/08	70cm	EM48rs	96	192
KA9EGM	P4	P5	2211	06/01/08	70cm	EM58kn	21	42
K4VXP	P4	P5	1212	06/02/08	70cm	EM77hi	201	402
W4HTB	P1	P1	0005	06/04/08	70cm	EM66tx	163	326
K4NQV	P3	P4	1203	06/06/08	70cm	EM66sx	159	318
KC4WEN	P1	P2	1206	06/06/08	70cm	EM67sa	157	314
KCØOW	P2	P2	1247	06/10/08	70cm	EM15gp	510	1020
K9KX	P2	P2	1329	06/10/08	70cm	EM15hs	518	1036
KCØMFL	P1	P1	1345	06/10/08	70cm	EM17io	462	924
KB8GUE	P1	P2	1223	06/11/08	70cm	EM89fi	296	592
K9KKL	P2	P4	0103	06/12/08	70cm	EM59ds	112	224
W9NTP	P2	P3	1151	06/12/08	70cm	EM79ek	192	384
KB9WLM	P3	P4	1237	06/12/08	70cm	EN50bm	163	326
K9SM	P1	P4	1255	06/14/08	70cm	EM59ee	75	150
K9SM	P1	P4	1409	06/14/08	23cm	EM59ee	75	450
WB8LGA	P3	P4	1143	06/21/08	70cm	EN80ok	357	714
N9XHU	P3	P4	1237	06/21/08	23cm	EM59et	113	678
						Page 1	17081	40958

3 letters short of the 2-way, just couldn't read the UQD part. Or the 1.2 FM with Hank, W4HTB in Bowling Green KY. He was P-5 here but a local broadcast TV stations harmonic kept him from seeing me there and robbed us of our first 23cm 2-way. Another notable 1-way on 23cm was with NR8TV in Ohio who would have been my best DX ever on that band if my RX had been just a little bit more sensitive and another 1-way with KCØOW in OK that was in August.

To sum things up I had 83 Q's and worked 10 different states this year OK, KS, MO, IL, IN, MI, OH, TN, KY, and MS.

A special thanks to Bob, AA9MY/5 for going portable in Mississippi and giving me ATV state #14 for my all time stats!

THANKS GENE FOR A GREAT CONTEST !!!

KC0OW SOAPBOX:

Bob, Here's a summary for you for our contacts today, July 20, 2008. Temp today, before u came thru, had reached high of 100.6 in the shade here at EM15gu. When u were coming thru I'd

KA9UVY

STATION WORKED	REPORT SENT	REPORT RECEIVED	UTC	DATE	FREQUENCY	Grid Sw.	Miles	Points
WU8O	P2	P1	1322	06/21/08	70cm	EN80ic	324	648
N9UQD	P4	P4	1335	06/21/08	70cm	EM58rh	17	34
KC9BIE	P3	P3	2319	06/21/08	70cm	EM57mr	37	74
N9XHU	P2	P1	0120	07/01/08	70cm	EM59et	113	226
W8ZCF	P2	P2	0137	07/01/08	70cm	EM79tb	248	496
W4HTB	P2	P2	0149	07/01/08	70cm	EM66tx	163	326
K4NQV	P2	P4	1158	07/01/08	70cm	EM66sx	159	318
NR8TV	P1	P2	0805	07/02/08	70cm	EM89hh	304	608
N9RZZ	P4	P4	0427	07/05/08	70cm	EM57mv	27	54
AA9MY	P2	P1	0430	07/05/08	70cm	EN50fm	158	316
N9RZZ	P4	P5	0507	07/05/08	23cm	EM57mv	27	162
W9NTP	P2	P1	1158	07/05/08	70cm	EM79ek	192	384
K4VXP	P1	P2	1202	07/05/08	70cm	EM77hi	201	402
WU8O	P1	P1	0112	07/08/08	70cm	EN80ic	324	648
KB8GUE	P1	P2	0118	07/08/08	70cm	EM89fi	296	592
K9XXL	P1	P1	0114	07/10/08	70cm	EM59ds	112	224
N9XHU	P1	P3	1315	07/10/08	23cm	EM59ee	113	678
KØPFX	P2	P4	1341	07/10/08	70cm	EM48sr	91	182
K9SM	P2	P3	1358	07/10/08	23cm	EM59ee	75	450
K9SM	P3	P4	1359	07/10/08	70cm	EM59ee	75	150
KC9BIE2	P3	P3	2002	07/12/08	70cm	EM57jr	41	82
WB8LGR	P1	P1	1215	07/17/08	70cm	EN80ok	357	714
					Page 2		17081	40958

I didn't see the callsign on the screen, I was in filter position No. 1, and because of that, it was at the bottom, but distorted. I could clearly see it when I went to filter bypass position.

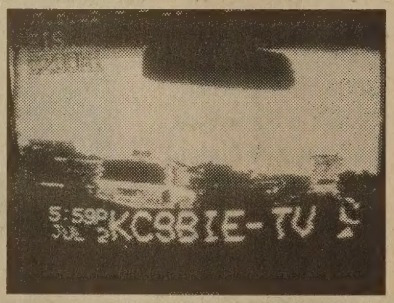
Here are some pix, I deleted a bunch of them because my digital camera has a delay and the signal was in and out a lot...and a novice like me had difficult time tracking with beam. All were captured when your mobile was just south on I-35, I believe, just past the 1-44/I-35 junction. That would be 17 air miles from here.

I really had fun tracking you and Shannon. I had been out in the hot sun mowing earlier and timed it so that I would be back in the shack as you approached. I tracked you beginning early this morning.

Best 73 and we'll have to see you and Shannon in color from Rick's qth.....de kc0ow EM15gu

W8ZCF Soapbox:

Hi Bob, The attached pictures confirm my reception of your 439.25 (P5+) and 1280 MHz (P3) video on August 3, 2008 around 7:45 AM. I calculate the distance between us as 248 miles and is a 1st for an estimate the temp to be around 100. I first started detecting sync from you & Shannon, IF you were transmitting, when you were just on the west side of Sapulpa, Okla., which is 67 air miles from here. I saw u p1 and u heard me tell you on 2 meters you were p1, but you could not receive video from me, when you were at Bristow, Okla. That is 52 air miles from here. When we made contact and exchanged signal reports, you were 5 miles east of Wellston, Okla. which is 25 air miles from here. You were at EM15mq and you were P1 here. You gave me a p1, then a p2. So, that looks like 50 points for the contest. When you got in to OKC and I made the comment that exchange Cincinnati/ Mt Vernon, IL.



Good opening, hope another one comes soon. If you might have recorded my pictures I would appreciate a copy when you get caught up.

Tnx again for the exchange.

73, Farrell,W8ZCF

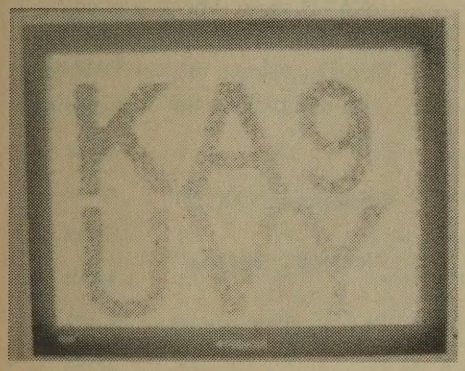
WB8TGY Soapbox:

Thanks again for my first DX ATV QSO. Attached is a photo of your ID slide. I may have a better one in my digital camera. I had

taken the memory card out to copy it to my PC when you came back and wanted to try again. So when I worked you I didn't have my memory card in the camera.

If I get a chance I'll try and download that one, and if it's a lot better I'll send it to you.

73, Mark WB8TGY



KC9BIE Soapbox

KC9BIE Mobile equipment:

Modified PC Electronics TC70-10 with synthesized or tunable RX and 70 MHz (if) output into adjustable 70 MHz saw filter feeding 5" B/W Spectra TV and an Icom 706 MK2G for carrier detect.

The TC70-10 feeds a Teletec DXUP-150 solid state amp for an average power output of 45 watts to a single K5VH Super Wheel true omni horizontal on a Tri mag mount.

DX Video ID is provided by a sandisk photo viewer and live camera is a Panasonic VHS-C camcorder with Intuitive circuits overlay board.

Talk back and APRS radio is Kenwood D700a that provides direct Grid/sub Grid information via a dedicated Byonics GPS unit.

I had lots of fun this year even though I didn't make any special trips to Bald Knob. The high cost of gas and limited time available kept me close to home most of the time. The one exception was our vacation trip out west to Oklahoma and Kansas were I did get to work some new ones for the log and had lots of fun showing the guys out there what mobile

KA9UVY

STATION WORKED	REPORT SENT	REPORT RECEIVED	UTC	DATE	FREQUENCY	Grid Sw.	Miles	Points
WA9EUN	P2	P2	0311	07/19/08	70cm	EN51rg	235	470
KCØHFL	P1	P1	1800	07/31/08	70cm	EM17io	462	924
KDØFW	P4	P2	2239	07/31/08	70cm	EM29tc	303	606
N4QWZ	P2	P2	2248	07/31/08	70cm	EM66ok	170	340
KCØEMX	P1	P3	0142	08/01/08	70cm	EM17kj	455	910
NK9M	P3	P2	0417	08/01/08	70cm	EN51up	234	468
KCØHFL	P3	P2	0441	08/01/08	70cm	EM17io	462	924
WØDQY	P3	P5	0556	08/01/08	70cm	EM48rs	96	192
KØPFX	P3	P5	0602	08/01/08	70cm	EM48sr	91	182
NR8TV	P2	P2	0951	08/01/08	70cm	EM89hh	304	608
KB8GUE	P1	P2	1852	08/01/08	70cm	EM89fi	296	592
W4HTB	P3	P4	1123	08/01/08	70cm	EM66tx	163	326
WB8LGA	P3	P4	1159	08/01/08	70cm	EN80ok	357	714
K4NQV	P2	P4	1204	08/01/08	70cm	EM66sw	159	318
KC4WFN	P2	P2	1205	08/01/08	70cm	EM67sa	157	314
K4VXP	P2	P4	1208	08/01/08	70cm	EM77hi	201	402
AA9MY/5	P1	P1	1259	08/01/08	70cm	EM54gi	272	544
N9XMU	P1	P1	0321	08/01/08	70cm	EM59et	113	226
KB9PWQ	P2	P3	0452	08/03/08	70cm	EN61cx	261	522
KB9WLM	P4	P5	0511	08/03/08	70cm	EN50bm	163	326
N9UKB	P1	P5	0541	08/03/08	70cm	EN41rb	211	422
W8ZCF	P3	P2	2341	08/03/08	23cm	EM79tb	248	1488
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KA9UVY

STATION WORKED	REPORT SENT	REPORT RECEIVED	UTC	DATE	FREQUENCY	Grid Sw.	Miles	Points
W9ZIM	P5	P5	0800	08/04/08	23cm	EN51nw	252	1512
W8RVH	P1	P2	0039	08/04/08	23cm	EM79xw	283	1698
W8RVH	P2	P3	0043	08/04/08	70cm	EM79xw	283	566
NK9M	P4	P5	0115	08/04/08	23cm	EN51up	234	1404
W9ZIM	P5	P5	0217	08/04/08	70cm	EN51nw	252	504
KC8LMI	P3	P3	0246	08/04/08	70cm	EN72tj	369	738
WB8TGY	P1	P3	0517	08/04/08	70cm	EN72pp	372	744
KØPFX	P1	P5	0542	08/04/08	23cm	EM48sr	91	546
K9SH	P5	P5	1301	08/08/08	23cm	EM59ee	75	450
K9SH	P3	P4	1422	08/08/08	70cm	EM59ee	75	150
K9KKL	P1	P1	0018	08/09/08	70cm	EM59ds	112	224
N9XMU	P1	P3	0115	08/21/08	23cm	EM59et	113	678
N3VL	P4	P4	1247	08/21/08	70cm	EM57no	46	92
WU9O	P1	P1	0224	08/23/08	70cm	EN30ic	324	648
KBØFW	P2	P2	1436	08/25/08	70cm	EM29tc	303	606
AA9MY	P3	P2	0107	08/26/08	70cm	EN50fm	158	316
K9IDQ	P1	P5	1156	08/231/08	70cm	EM59bw	126	252
						Page 4	17081	40958

KC0OW

STATION WORKED	REPORT SENT	REPORT RECEIVED	UTC	DATE	FREQUENCY	Grid Sw.	Miles	Points
KA9UVY	P3	P1	12:58	6/10/08	70cm	EM58ng	509	1018
KC0HEL	P3	P3	03:20	6/14/08	70cm	EM17io	138	276
K9KK	P5	P5	14:08	6/14/08	70cm	EM15he	29	58
K9SM	P2	P2	15:05	6/14/08	70cm	EM59ee	496	992
KC0HEL	P1	P1	12:52	7/5/08	70cm	EM17io	138	276
KC9BIE	P1	P2	21:49	7/20/08	70cm	EM15mg	25	50
KC0HEL	P5	P5	14:30	8/2/08	70cm	EM17io	138	276
						Page 1	1473	2946

N9XHU

STATION WORKED	REPORT SENT	REPORT RECEIVED	UTC	DATE	FREQUENCY	Grid Sw.	Miles	Points
K9KKL	P5	P5	00:17	6/01/2008	70cm	EM59ds	5	10
KA9UVY	P2	P1	00:40	6/01/2008	70cm	EM58ng	113	226
W9ZIH	P2	P1	01:51	6/01/2008	70cm	EN51nw	151	302
KC9BIE	P1	P1.5	12:40	6/02/2008	70cm	EM58ng	113	226
W9NTP	P3	P2	12:42	6/02/2008	70cm	EM79ek	214	428
AA9MY	P5	P5	14:03	6/02/2008	70cm	EN50fn	49	98
W9YZB	P1.5	P1.5	14:06	6/02/2008	70cm	EM58nh	111	222
K0PEX	P1	P1	14:35	6/02/2008	70cm	EM48sr	87	174
KB9WLM	P2	P1.5	01:40	6/10/2008	70cm	EN50bm	50	100
K9SM	P3	P3	12:52	6/14/2008	70cm	EM59ee	43	86
W8ZCF	P1	P1	13:22	6/14/2008	70cm	EM79tb	285	570
KA9EGM	P1	P2	14:22	6/14/2008	70cm	EM58kn	93	186
KA9UVY	P2	P1	12:37	6/21/2008	23cm	EM58ng	113	678
W9ZIH	P5	P3	12:49	6/30/2008	23cm	EN51nw	151	906
KA9UVY	P1	P2	01:24	7/01/2008	70cm	EM58ng	113	226
W9ZIH	P4	P2	12:27	7/01/2008	23cm	EN51nw	151	906
KA9EGM	P2	P4	12:53	7/10/2008	70cm	EM58kn	93	186
KA9UVY	P3	P1	13:15	7/10/2008	23cm	EM58ng	113	678
K0PEX	P1	P2	13:39	7/10/2008	70cm	EM48sr	87	174
WA9EUX	P3	P2	03:55	7/18/2008	70cm	EN51rg	141	282
W8ZCF	P1	P1	12:16	7/21/2008	70cm	EM79tb	285	570
KB9JGF	P1	P2	12:40	7/24/2008	70cm	EN70mb	248	496
						Page 1	5283	13330

ATV is like.

All in all I worked only 4 states this year but during one of the Western openings my mobile was seen from Mt. Vernon IL all the way to Udall Kansas. KCØEMK was able to see my video rolling through but just under P-1.

Another highlight was seeing W8ZCF in Cincinnati OH coming into my mobile P-2 during the big opening around the first of August. Those were the two Big ones that got away, my best again this time was W9ZIH in Malta IL at 252 miles, not bad mobile to base but I am convinced that I can do better next year.

Plans are to stack two of the K5VH super wheels and add a preamp for next year and if fuel costs go down or even hold their ground make a few trips to the hill.

Soapbox N9XHU

N9XHU, EM59et

Leonard McWhorter

837 N. Hill St.

Springfield, IL. 62702-6229 USA

mcwhortera@comcast.net

Total Miles 5283

Total Points 13330

Total States Worked 6

IL., IN., KY., MO., OH., KS.

2 Meters

YAESU all mode transceiver FT 847

ICOM all mode transceiver 756 PRO

AMERITRON ALS 500M Amplifier

MIRAGE B2516G, 160 Watts amplifier.

LMR 600 feed line.

Antenna CUSHCRAFT A148-20T vertical and horizontal Yagi at 55 feet.

Antenna 80 Meter Inverted V for 75 Meters.

N9XHU

STATION WORKED	REPORT SENT	REPORT RECEIVED	UTC	DATE	FREQUENCY	Grid Sw.	Miles	Points
KA9EGM	P3	P4	02:43	8/01/2008	70cm	EM58kn	93	186
NK9M	P3	P4	04:06	8/01/2008	70cm	EN51wp	144	288
W0DQY	P3	P4	04:16	8/01/2008	70cm	EM48rs	87	174
KC0EMX	P2	P4	04:28	8/01/2008	70cm	EM17kj	438	876
KA9UVY	P1	P1	03:21	8/02/2008	70cm	EM58ng	113	226
W9ZIM	P4	P4	12:15	8/02/2008	70cm	EN51nw	151	302
W8ZCF	P2	P2	12:19	8/02/2008	70cm	EM79tb	285	570
KB9PWQ	P1	P2	05:07	8/03/2008	70cm	EN61cx	177	354
NR8TV	P1	P1	11:57	8/03/2008	70cm	EM89hh	335	670
N9UQB	P1	P3	23:28	8/03/2008	70cm	EM58rh	118	236
W4HTB	P2	P2	00:11	8/04/2008	70cm	EM66tx	263	526
KB9WLH	P1	P1	13:10	8/08/2008	23cm	EN50bm	58	300
N9ZGE	P4	P5	20:22	8/14/2008	70cm	EM59ds	5	10
KA9UVY	P3	P1	01:15	8/21/2008	23cm	EM58ng	113	678
K0PFX	P1	P1	00:16	8/25/2008	70cm	EM48sr	87	174
K9IDQ	P4	P5	11:58	8/31/2008	70cm	EM59bw	15	30
						Page 2	5283	13330

W4HTB

STATION WORKED	REPORT SENT	REPORT RECEIVED	UTC	DATE	FREQUENCY	Grid Sw.	Miles	Points
NR8TV	P1	P1	0846	06-03-2008	70cm	EM89hh	229	458
W8ZCF	P2	P2	0105	06-03-2008	70cm	EM79tb	180	360
KA9UVY	P1	P1	0805	06-04-2008	70cm	EM58ng	163	326
K4VXP	P3	P3	1125	06-09-2008	70cm	EM77hi	60	120
W8ZCF	P1	P2	0145	07-01-2008	70cm	EM79tb	180	360
KA9UVY	P2	P2	0155	07-01-2008	70cm	EM58ng	163	326
K4VXP	P3	P2	0155	07-01-2008	70cm	EM77hi	60	120
NR8TV	P1	P1	0158	07-08-2008	70cm	EM89hh	229	458
W9ZIM	P1	P3	0808	07-19-2008	70cm	EN51nw	367	734
WB8LGA	P1	P1	1200	07-29-2008	70cm	EN80ok	307	614
KB8GUE	P1	P1	1213	07-29-2008	70cm	EM89fi	225	450
W8RVH	P1	P1	2355	07-24-2008	70cm	EM79nv	240	480
KA9UVY	P4	P3	1121	08-01-2008	70cm	EM58ng	163	326
W8ZCF	P2	P3	2330	08-01-2008	70cm	EM79tb	180	360
NR8TV	P1	P1	1155	08-02-2008	70cm	EM89hh	229	458
N9XHU	P2	P2	0010	08-04-2008	70cm	EM59et	263	526
W9ZIM	P2	P4	0234	08-04-2008	70cm	EN51nw	367	734
N4QWZ	P5	P4	0200	08-05-2008	70cm	EM66ok	43	86
KG4GWB	P1	P1	1155	08-28-2008	70cm	EM79se	80	160
						Page 1	3728	7456

70 CM

RECEIVER

P. C. Electronics down converter TVC4G. Preamp 16db.

P. C. Electronics TC70-20 transceiver Preamp 16db.

2 SHARP 13 inch color cable ready televisions.

2 ZENITH 9 inch color cable ready television.

1 ICOM R3 hooked to Bandpass Filter.

Antenna M2 440-21 ATV Yagi at 55 feet.

LMR 600 feed line.

TRANSMITTER

Homebrew B. T. Bryant (K9KKL)

Blonder Tongue AM 60-550 Agile modulator with a P. C. Electronics 20 Watt brick.

10 Watts with video.

P. C. Electronics TC70-20 transceiver 10 Watts with video.

Homebrew tube amplifier 4CX250B 100 Watts with video. Built by Bill Bryant (K9KKL).

Sand Disk JPG slide with call. Black letters on white background.

Antenna M2 440-21 ATV Yagi at 55 feet.

LMR 600 feed line.

23 CM

RECEIVER and TRANSMITTER

YAESU FT 736R with 1.2GHz module 10 Watts.

YAESU TV 736 modulator and demodulator AM TV Video and

NR8TV

STATION WORKED	REPORT SENT	REPORT RECEIVED	UTC	DATE	FREQUENCY	Grid Sw.	Miles	Points
KA9UVY	P1	P1	8:34:29 PM	6/1/2008	70cm	EN58ng	308	616
KB8GUE	P5	P5	8:41:18 PM	6/1/2008	70cm	EM39fi	11	22
W4HTB	P1	P1	8:46:45 PM	6/3/2008	70cm	EM66tx	234	468
WB8LGA	P5	P1	8 23 58 PM	6/4/2008	70cm	EN80ok	78	156
W8ZCF	P4	P5	7.37.11 AM	6/4/2008	70cm	EM79tb	59	118
W9ZIH	P1	P1	7:59:05 AM	6/4/2008	70cm	EN51nw	340	680
WB8DZW	P4	P4	11:59:43 AM	6/18/2008	70cm	EN80ka	45	90
WA9EEI	P2	P1	7:18:12 PM	6/8/2008	70cm	EM79ah	140	280
KB8OFF	P3	P2	8:35:44 PM	6/9/2008	70cm	EM79wx	48	96
KA8NBT	P3	P2	8:45.34 PM	6/9/2008	70cm	EM79ut	58	116
WU8O	P4	P4	9:00.26 PM	6/9/2008	70cm	EN80ic	49	98
KR8LWR	P3	P2	8:43:31 PM	6/10/2008	70cm	EN80mt	100	200
W8BMR	P4	P3	8:38:49 PM	6/12/2008	70cm	EM89mx	45	90
KB8SSH	P3	P4	8:47:52 PM	6/12/2008	70cm	EN80ma	48	96
K4NQV	P1	P1	7:54:27 AM	6/13/2008	70cm	EM66sx	237	474
KC4WFN	P1	P1	7:56:23AM	6/13/2008	70cm	EM67sa	235	470
K4VXP	P3	P3	8:00:15 AM	6/13/2008	70cm	EM77hi	178	356
WB8LGA	P3	P1	9:53:24PM	6/15/2008	23cm	EM66tx	78	468
KB8YMQ	P4	P4	8:08:54PM	6/23/2008	70cm	EN80ic	49	98
WA8RUT	P3	P1	8:28:34pm	6/23/2008	70cm	EN80ma	48	96
WA8RMC	P5	P3	8:28:34PM	6/26/2008	23cm	EN80nc	55	330
W8RRF	P3	P2	8:53.23PM	6/26/2008	23cm	EM89ot	41	246
							7188	16340

Page 1

NR8TV

STATION WORKED	REPORT SENT	REPORT RECEIVED	UTC	DATE	FREQUENCY	Grid Sw.	Miles	Points
K8TPY	P4	P4	9:27:45PM	6/26/2008	70cm	EN80ma	48	96
W8RRF	P5	P5	9:32:28PM	6/26/2008	70cm	EM89ot	41	82
N8LRG	P5	P5	9:36:13PM	6/26/2008	70cm	EM89kv	37	74
WU8O	P2	P5	9 42 57PM	6/26/2008	23cm	EN80ic	49	294
KA9UVY	P1	P2	08.04.19PM	07/02/2008	70cm	EM58ng	308	616
W8RVH	P5	P5	7:58:23AM	7/6/2008	70cm	EM79xw	53	106
W8RVH	P5	P5	8:16:23AM	7/6/2008	23cm	EM79xw	53	318
W4HTB	P1	P1	9:58:45PM	7/8/2008	70cm	EM66tx	234	468
WA9EEI	P2	P2	7:52:14AM	7/17/2008	70cm	EM79ah	140	280
K4VXP	P1	P1	8 03 13AM	7/17/2008	70cm	EM77hi	178	356
W9ZIH	P3	P4	8:13:45am	7/17/2008	70cm	EN51nw	340	680
WB8LGA	P4	P4	7:57:23AM	7/19/2008	23cm	EN80ok	78	468
WB8LGA	P5	P5	7:59:29AM	7/19/2008	70cm	EN80ok	78	156
W8ZCF	P3	P5	8:06:54AM	7/19/2008	23cm	EM79tb	59	354
WA8NWY	P5	P5	8:25:45AM	7/20/2008	70cm	EM89fd	19	38
W9NTP	P3	P3	7:35:54AM	7/29/2008	70cm	EM79ek	122	244
WA8KQQ	P2	P2	9:22:34PM	7/30/2008	70cm	EN70qc	84	168
KA9UVY	P2	P2	5:55:34AM	8/01/2008	70cm	EM58ng	308	616
WB8LGA	P5	P5	7:44:34AM	8/02/2008	70cm	EN80ok	78	156
W4HTB	P1	P1	7:55:23AM	8/20/2008	70cm	EM66tx	234	468
K4VXP	P3	P3	7:56:21AM	8/20/2008	70cm	EM77hi	178	356
KR8LWR	P3	P1	9:26:45PM	8/03/2008	70cm	EN80mt	100	200
							7188	16340

Page 2

Sound.

Antenna 43 element loop at 57 feet.

7/8 Hard Line feed line.

ACCESSARIES

GO-VIDEO DVD and VHS tape player and recorder.

HYUNDAI CO1120 auto electronic switcher.

RCA Small Wonder cam recorder.

Just no band openings into Springfield, IL. . Best contact

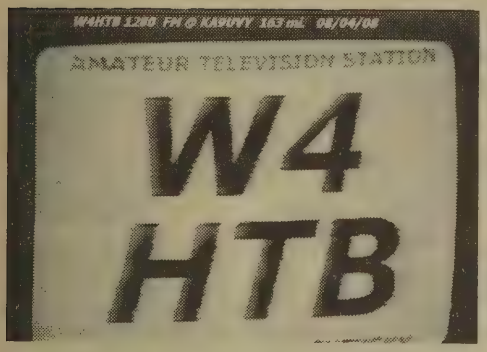
Was Dave (KC0EMK) in Udall, KS. 438 miles. I had a lot of fun working the stations I did see. Maybe next year.

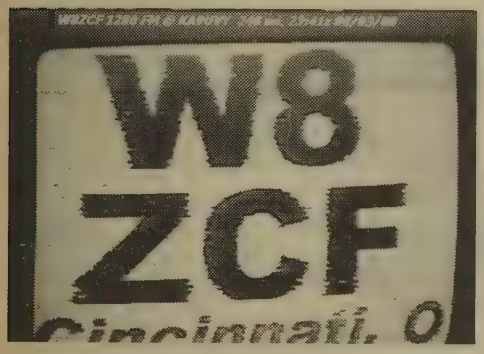
Leonard McWhorter, N9XHU

Editor: Sorry I did not have enough room for all scoresheets.

ATVQ

STATION WORKED	REPORT SENT	REPORT RECEIVED	UTC	DATE	FREQUENCY	Grid Sw.	Miles	Points
N9XHU	P1	P1	7:57:54AM	8/03/2008	70cm	EM59et	336	672
WB8LGA	P5	P5	8:05:45AM	8/03/2008	23cm	EN80ok	78	468
W9ZIH	P3	P4	10:30:24PM	8/04/2008	70cm	EN51nw	348	680
KC8LMI	P2	P2	10:49:31PM	8/04/2008	70cm	EN72tj	214	428
NK9M	P2	P2	12:19:23PM	8/04/2008	70cm	EN51up	304	608
W0DQY	P2	P2	12:47:12PM	8/04/2008	70cm	EM48rs	389	778
WA8KQQ	P1	P1	9:19:45PM	8/07/2008	70cm	EN70qc	84	168
WA9EEI	P2	P2	8:15:12AM	8/16/2008	70cm	EM79ah	140	280
						Page 3	7188	16340





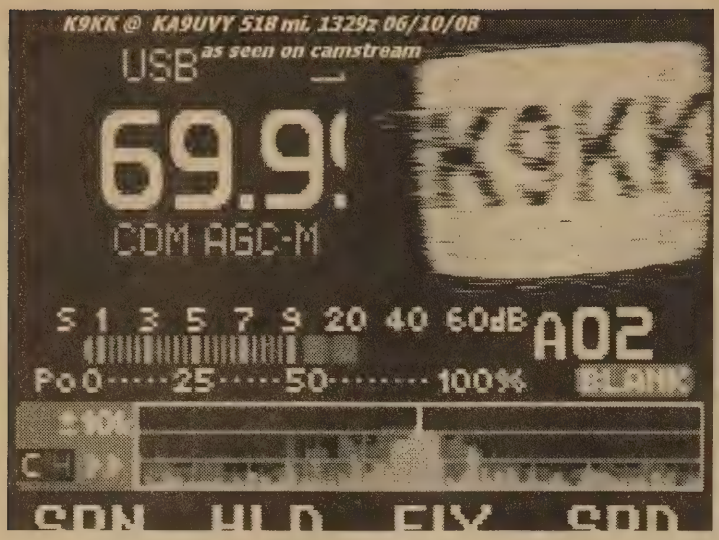
all: WU8O Grid: EN80ic Class: Home

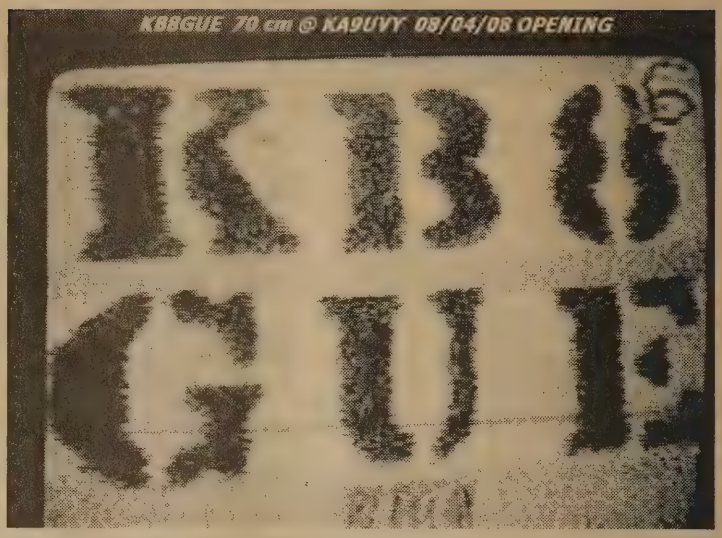
STATION WORKED	REPORT SENT	REPORT RECEIVED	UTC	DATE	FREQUENCY	GRID SQ	MILES	POINTS
NR8TV	P4	P4	1:00	06/09/07	439.25	EM89hh	55	110
WB8LGA	P3	P4	2:56	06/10/08	439.25	EN80oj	34	68
KB8SSH	P4	P4	1:16	06/12/08	439.25	EN80ma	20	40
W8DMR	P2	P4	1:21	06/12/08	439.25	EM89mx	21	42
KB8GUE	P3	P4	1:51	06/12/08	439.25	EM89fi	53	106
WB8LGA	P5	P5	12:28	06/15/08	1280	EN80oj	34	204
KB8GUE	P3	P5	12:38	06/15/08	439.25	EM89fi	53	106
W8ILC	P1	P5	12:55	06/15/08	439.25	EM79wu	47	94
W8ZCF	P5	P5	13:11	06/15/08	439.25	EM79tb	91	182
KA9UVY	P1	P2	13:21	06/21/08	439.25	EM58ng	325	650
W8RUT	P2	P4	0:34	06/23/08	439.25	EN80nf	23	46
KB8YMQ	P4	P5	0:41	06/23/08	439.25	EN80ic	6	12
WB8DZW	P5	P3	0:57	06/23/08	439.25	EN80ka	12	24
KC8LMI	P1	P2	2:06	06/25/08	439.25	EN72tj	166	332
N8LRG	P4	P3	2:24	06/25/08	439.25	EM89kv	18	36
NR8TV	P4	P5	10:04	06/26/08	1280	EM89hh	55	330
KA9UVY	P1	P1	1:11	07/08/08	439.25	EM58ng	325	650
W8ZCF	P2	P4	1:33	07/08/08	439.25	EM79tb	91	182
W8RVH	P5	P4	2:17	07/10/08	439.25	EM79xw	41	82
WA9EUN	P1	P1	3:30	07/19/08	439.25	EN51rq	295	590
KA8ZXX	P2	P2	4:10	07/19/08	439.25	EN72uj	166	332
W8ZCF	P3	P4	2:12	08/01/08	439.25	EM79tb	91	182
KA9UVY	P1	P1	2:23	08/23/08	439.25	EM58ng	325	650
WA8KQQ	P1	P2	2:25	08/31/08	439.25	EN70qc	70	140

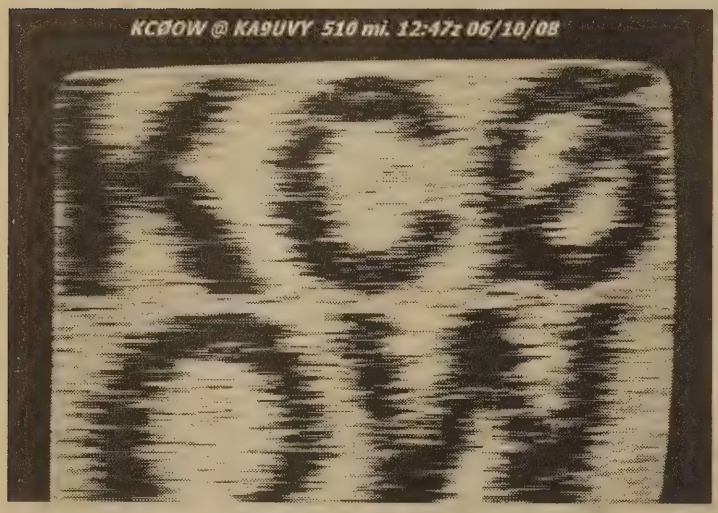
Total Miles **2417** **Total Points** **5190**

KC9BIE ATV MOBILE LOG 2008

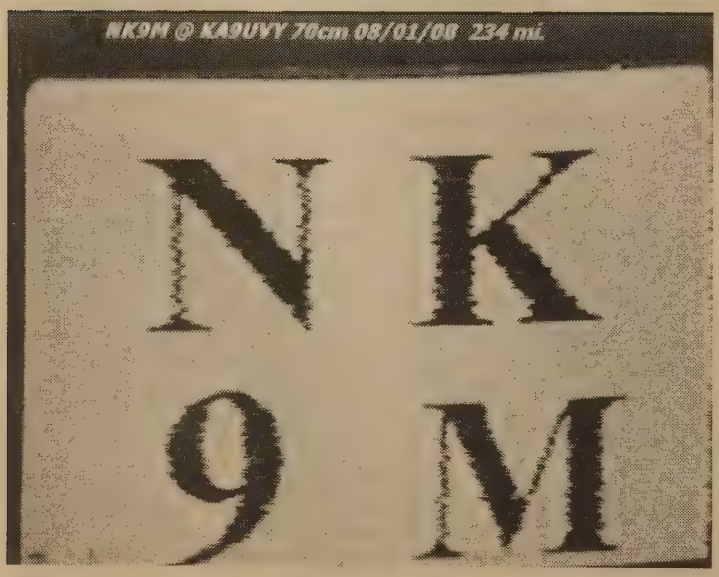
Station	gr sq	time	name	my grid	sent	rec	date	mile	points
W0DQY	EM48RS	4:15	SMITTY	EM58MH	P 2	P 2	6/1/2008	91	182
N9XHU	EM59ET	12:40	LEONARD	EM58NG	P 1	P 1	6/2/2008	113	226
W9ZIH	EN51NW	13:03	RON	EM58NG	P 3	P 1	6/2/2008	252	504
AA9MY	EN50FM	14:00	BOB	EM58NG	P 1	P 1	6/2/2008	158	316
KA9UVY	EM58NG	23:19	ROBERT	EM57MR	P 3	P 3	6/21/2008	37	74
KA9UVY	EM58NG	20:02	ROBERT	EM57JR	P 3	P 3	7/12/2008	41	82
KC0OW	EM15GO	21:49	SCOTT	EM15MQ	P 2	P 1	7/20/2008	28	56
K9KK	EM15HE	17:45	RICK	EM15HS	P 1	P 1	7/24/2008	39	78
KC0HFL	EM17IO	16:56	BOB	EM17KR	P 1	P 1	7/27/2008	12	24
KC0EMK	EM17KJ	17:05	DAVE	EM17MS	P 3	P 4	7/27/2008	27	54
KD0FW	EM29TE	20:10	MIKE	EM39AA	P 5	P 1	7/27/2008	23	46
							TOTAL	821	1642

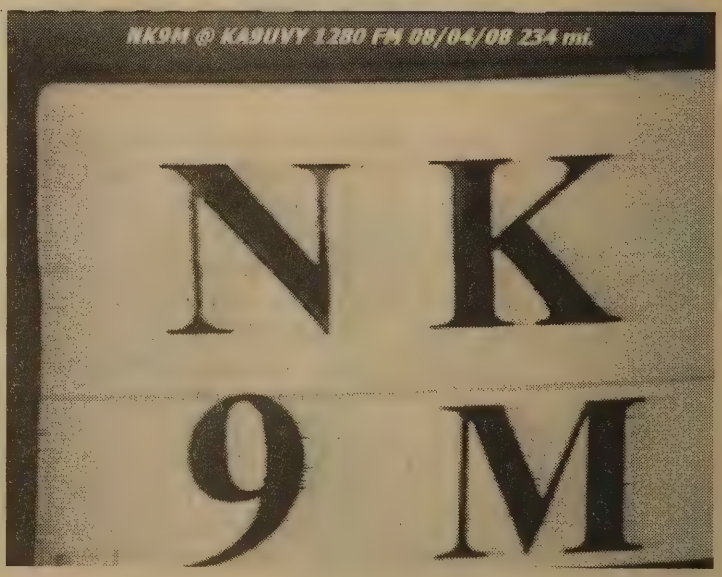

K9KK @ KA9UVY 518 mi. 1329z 06/10/08
as seen on camstream
USB
69.9
COM AGC-M
S 1 3 5 7 9 20 40 60dB
A02
Po 0 25 50 100%
BLANK
K9KK


KBBGUE 70 cm @ KA9UVY 08/04/08 OPENING


KCØOW @ KA9UVY 510 mi. 12:47z 06/10/08
KCØ


KCØHFL @ KA9UVY 462 mi. 04:41z 08/01/08
KCØ
HFL
WICHITA, KS


NK9M @ KA9UVY 70cm 08/01/08 234 mi.
N K
9 M


NK9M @ KA9UVY 1280 FM 08/04/08 234 mi.
N K
9 M

KC5SAS ATV Community Service at LSU July 26 & 27, 2008

By: Steve Raacke, KC5SAS Email: cellblock776@yahoo.com
1357 St Francis Lane
Saint Gabriel, LA 70776

It had been 4 months since I last used my ATV gear at a community service event. Back in March 2008 I had set up my station at a "fun run". My received signal was less than spectacular. I vowed to do better the next time.

Due to work and other circumstances I had been unable to include ATV in my volunteer positions at recent events. This time I planned ahead. I put in for time off from work, taking a long weekend. I tested everything and made sure I was ready for just about anything. When Baton Rouge Amateur Radio Club (**www.lsu.edu/brarc/index.htm**) member Jim, N5IB, put out emails asking for volunteers for the Rocketchix and Rocketkidz (**www.rocketchix.com**) triathlons on Saturday, July 26 and Sunday, July 27 respectively, I was good to go. I, along with my partner Tena, KE5ECF, was assigned to my regular location near LSU's Tiger Stadium.

Tena and I started Saturday morning early. Before the sun had risen we were leaving our house for the short, 10 mile trip North to LSU in Baton Rouge.

My plan was the same as in past events. Check in at the Net Control station, get out event t-shirts, maps of the course and station assignment then set up the receive side of my station. Net control wasn't hard to find. Parked in a parking lot near the main stage and officials was the "Command Bus". Owned by BRARC member Bill, AB5G, this full sized coach has been modified to hold an impressive array of communications gear and a 70 foot tall telescoping mast. The bus is still a work in progress, evolving each time the club brings it out. Presently it doesn't have the capability to receive Amateur Television. Plans are to install a flat screen TV monitor and other ATV gear in the near future. Until then I bring everything needed.

First I needed to get my antenna which would receive the ATV signal up in the air. Before you point to the fact that there's a huge antenna mast built right into the bus I assure you that I gave it some thought. In fact, I have done that very thing before. I used an antenna which was mounted on the top of the mast in a past event. The antenna was cut for business/commercial UHF frequencies. While it worked well, I wanted something I could use, trimmed to the correct frequency which could be independent of the bus should it not be available.

This was a job for my "OLB Yagi". This is a small yagi antenna built by local ham Keith, KD5OLB. A wooden boom, 6 elements and a short length of coax are all there is to it. Keith tells me it had been sitting in his shack for a while before he donated it to me. The first public service event I used this antenna at was a "fun run" in March 2008. I didn't have the antenna aimed correctly and lots of trees blocked my signal so I was not happy with my work at that time. I vowed to do better.

So I had my antenna but what to mount it on? After months of on again off again ATV use I had still not gotten a decent antenna mast for my receive station. I am still using the same white 8 foot long piece of PVC pipe I started out with. The pipe is so handy and functional that I've gotten to the point where I'm pretty happy with it. It's easy to carry, light, can be propped up and tied to nearly any decent support. For instance, I decided to the perfect place for the mast for this event was attached to the mirror of the bus. So out came my bungee cord and duct tape.

Receive yagi antenna duct taped to the 8 foot section of PVC pipe.

Did I mention that I also haven't gotten around to getting a mast clamp for the little receive yagi? I am still duct taping the antenna to the PVC mast pole. It works well.

I wrapped the tape around the pole and antenna and stood the pole up next to the mirror mount Then I wrapped a bungee cord around the mast and mirror mount. I finished by wrapping a couple of turns of duct tap over the bungee cord as a precaution against it coming loose.

Finally I routed the coax through a sliding vent window next to the drivers seat. Remember when I said that the coax was short? It's short to reduce line loss which is good.

But a short coax presents other problems such as where you can place the equipment you are plugging it into. My receive station, in addition to the antenna and mast, consists of a 13 inch color TV and a cable ready VCR plugged into a 20 foot extension cord reel with 4 AC sockets.

I consulted with Bill and after a couple of minutes we decided that the only place for the TV and VCR would be right behind the drivers seat. The Net control operator would be able to look down from his desk and see the ATV broadcast with no problem. With that settled we plugged everything in, set the VCR to cable channel 60 and I headed out onto the course.

Day 1, Rocketchix

It was Saturday July 26, 2008. By 6:30 am hundreds of people had gathered near the LSU natatorium to participate in the Rocketchix triathlon. Members of the Baton Rouge Amateur Radio club, which was providing communications support for the event, fanned out to their assigned locations.

My partner Tena, KE5ECF and I were assigned to Run 2. The run course was set up in figure 8 pattern and this position was right in the middle where runners would pass going from the start line and back toward the finish. I had worked this position before and had even broadcast ATV from here so I knew what to expect.

It gets hot early I was lucky to have a site with plenty of oak trees for shade as well as a bus stop to use for relaxing. I have practiced quite a bit at setting up and taking down my ATV station and it really showed this weekend. I removed my gear from the trunk of my car and started putting everything together.

First I extended the tripod mast which was donated to me by Al, KD5NVE. This gets my antenna up about 8 feet above the ground.

On the mast I placed the transmit antenna for my station. This is a 10 element yagi formerly owned by Bruce, KB5WNU, who also provided the coax. The coax plugs into the back of my ATV transmitter, a Tridon 2000 made by Wyman Research Inc. This 3 watt AM transmitter was gathering dust before Buddy, N5BUD donated it to me. The transmitter is powered from an Everstart deep cycle marine battery. For video I use a JVC SVHS camcorder mounted on a cheap tripod I found at Walmart. To ID I simply held up a card with "KC5SAS, Amateur Television, Baton Rouge Louisiana" written on it in front of the camera.

I didn't time myself but I doubt it took more than 10 minutes to have everything set up and on the air. I called "Command" and had Net Control give me a signal report. I was told that my signal at the bus, about three tenths of a mile away, was perfect. Clear color and no static on the screen.

Now it was just a matter of waiting for the first runners to show up. The first swimmers were out of the pool and on the 12 mile bike course by 7:30. By 8am I was sending video of runners passing my station.

Net Control was using 146.52 simplex for stations on the course around campus and the BRARC club repeater on 146.79 -600. Many of the volunteers were new hams participating in their first community service event. This lead to several communications problems with net control not being able to hear several stations and having to ask for relays of messages.

TV and VCR receiving the ATV signal.

While the voice comms were giving everyone headaches, my ATV video was still making it in fine. Near the end of the event, Jim, N5IB, broadcast that as stations close the hams should come by the bus and check out the equipment there including my ATV images. By 10am the last of the runners had crossed the finish line. I packed up my ATV transmit gear and left my receive station at the bus ready for the next day.

Day 2, Rocketkidz

Sunday, July 27 was almost a repeat of the previous day. Tena and I arrived early, checked in at the bus and made sure everything was ready to receive my ATV transmissions. I set the VCR on cable channel 60, turned the TV on and checked the antenna attached to the mirror on the bus.

We drove to the same location as before and set up the ATV transmitter station. For the Rocketkidz event our position was

designated Radio 11. The kids were separated into 3 age groups with the oldest kids swimming, biking and running first. Just like the day before, the first swimmers were in the pool shortly after 7:30 and soon were pedaling past us.

The radio problems we had Saturday were still with us Sunday morning. If anything they seemed to get worse. No station was more than a mile and a half from the "Command bus" but net control was unable to hear many of them. I was using a Radio Shack HTX-204 HT with a Comet CH-725 high gain whip for voice communications. Even using high power I was unable to be heard reliably by net control less than 4/10ths of a mile away.

By the time I had event support staff coming up to my position to ask about the status of a couple of kids who had taken a wrong turn on the bike course I had become frustrated with using simplex and QSY'ed to the club repeater. When I was finally able to get ahold of Net Control I learned that nobody had notified the Ham Radio volunteers of any missing children on the course. Typical.

By 9:30am the last of the kids had ridden their bikes past our location. We got permission from "Command" to secure. Soon everything was packed into the car and we were leaving campus.

These would be the last Rocketchix/Rocketkidz events of the 2008 season. There are other community service events scheduled later this year and I'm planning on being there. If I use ATV for those I will certainly take photos and write up another article.

ATVQ

QRO VIDEO MODULATOR

By: Dwight Raddatz, WA9EUN Email: dbraddatz@netzero.net
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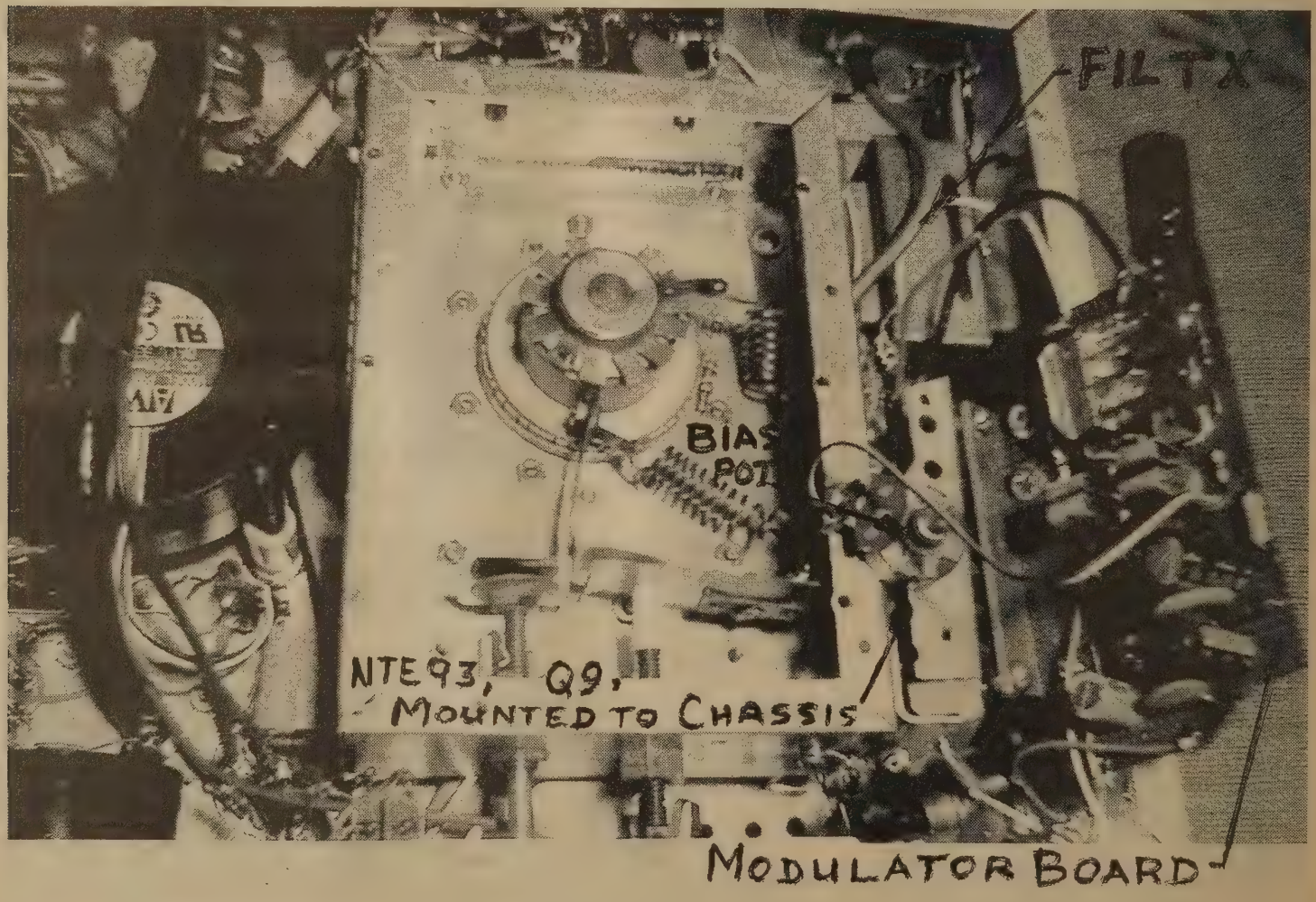
Plano, IL 60545

This modulator is designed around cathode modulation for a high powered tube type amplifier. The two major reasons for this type of modulation is that the modulation envelope is amplified and added to the RF driving signal and, most of all, since the modulator placement is in the final amplification stage of the RF amplifier, bandwidth problems become reduced.

These major advantages provide for better color transmission and video resolution. The modulator can amplify the video / audio RF signals 140 times without distortion, assuming the bias, drive and modulator input signals are properly set. For one volt P-P video input, video gain potentiometer set at 75%, and bias potentiometer set at 90 volts, using the GS35B Russian tube or any American counterpart.

With 65 watts drive the output of the amplifier will be in excess of 600 watts as read on a Bird Wattmeter. The amplifier is protected by the bias circuit built into the modulator so that loss of video input or RF input will not allow the amplifier to draw excessive current. This design also provides a stable bias control should the operator desire to use the amplifier as a conventional linear!

Q1 is a linear amplifier which amplifies and inverts the video signal. The collector of this amplifier is loaded by a 4.7 K resistor and a parallel combination of a 6.8 K resistor and a 65 pf ceramic capacitor. This loading sets Q1 video voltage gain of approximately 20. The parallel combination of the 6.8 K resistor and the 65 pf capacitor set the linear gain which is applied to the 4.7 mfd capacitors, which in turn, apply the signal to the low distortion linear/inverter amplifiers Q2 and Q3...A video enhancer is not required since selecting the 65 pf capacitor and the .0022 mfd/ 680 pf emitter capacitor combination will set the color burst and high-frequency level, which can be easily exceeded by increasing the value of these capacitors! Also, a vertical sync stretcher is not required with this design.



Q1 should be heat sinked for 1 watt, Q2 & Q3 should be heat sinked for 2 watts each. With full bias, approx 100 volts, the reading at TP1 will be about 4.7 volts across the 300 ohm resistor, representing 15.7 milliamperes. As bias is reduced, the current will become less, approximately 1.4 volts at TP1 for 30 volts bias, representing 4.7 milliamperes.

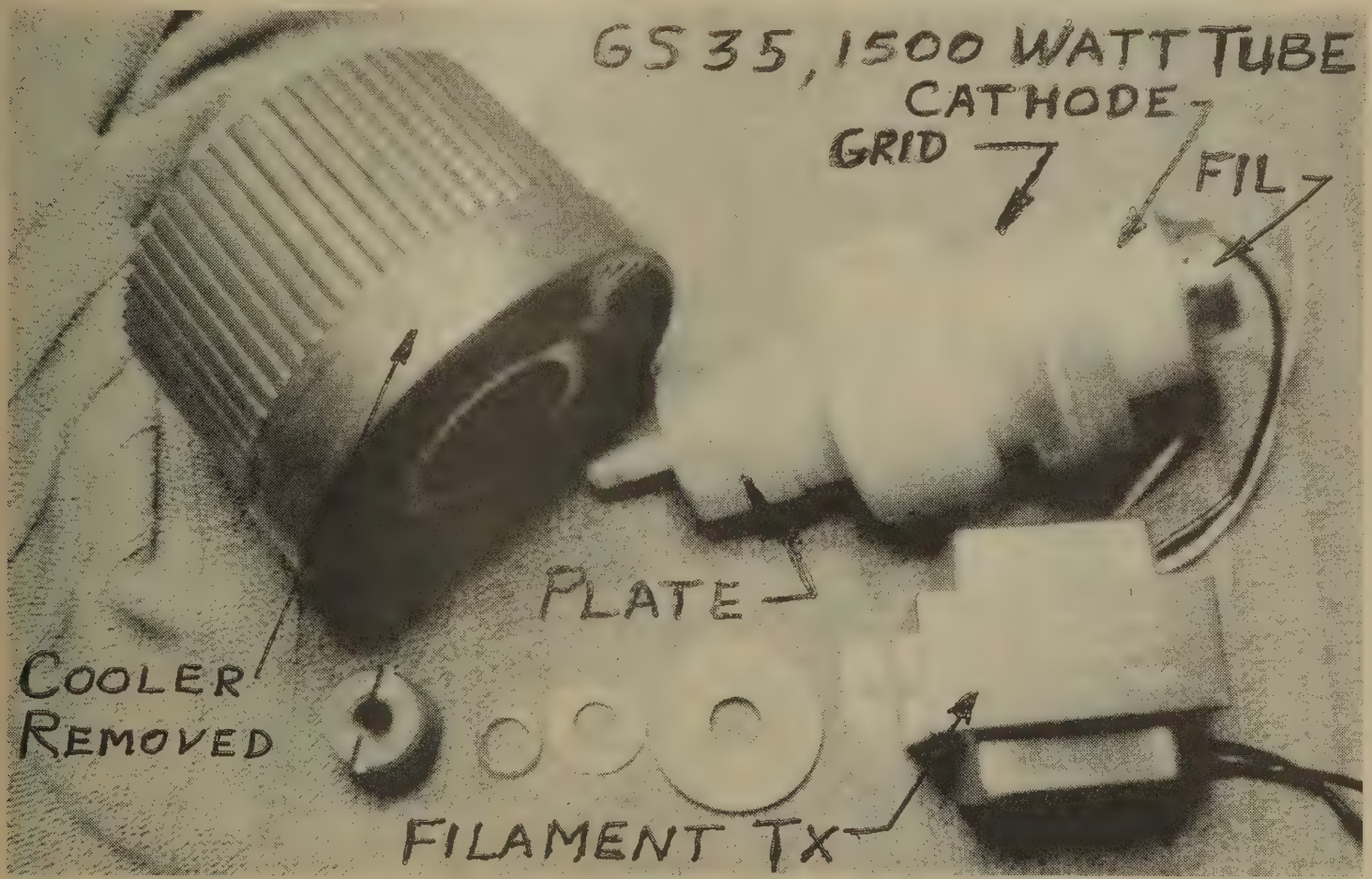
When the video input signal to Q2 & Q3 goes high, with respect to ground, Q2 conducts less because the emitter to base junction of Q2 becomes more positive while the emitter to base junction of Q3 maintains the same bias causing the collectors of both transistors to go low, towards ground...The opposite happens when the input video signal goes low, then both collectors go high with respect to ground. The bias control potentiometer controls the voltage median between the transistors. The circuit is self limiting so no component in the modulator or amplifier will be destroyed should the bias control be set improperly. It is possible to adjust the cathode median bias voltage from 25 to 100 volts and the video signal to 150 P-P volts, the optimum median bias setting for video transmission will be from 60 to 100 volts, depending upon drive and desired linear amplifier power output.

The diodes provide biasing for emitter follower transistors Q4 and Q5 to prevent any crossover distortion that usually occurs on circuits that omit the diodes. These emitter follower transistors provide a minimum current gain of 60. Remember the emitter follower does not provide voltage gain, only current gain (all voltage gain and linear phasing are accomplished with Q1, Q2, and Q3).

Another emitter follower stage is provided, which provides a minimum current gain of 60 and is constructed by paralleling Q6 with Q10 and, Q7 with Q8. The 2.7 ohm resistors help the transistors in sharing the load since running, say 500 watts output, the power loading will be 2.5 watts per transistor. Needless to say, a good heat sink will be required even though the transistors are rated at 5 watts individually. The board generates 17 watts of heat so excess air from the cathode cooling fan, approximately 15 cfm, cools the board components.

The 22 ohm, 1/4 watt resistor, protects the modulator, should for some reason the tube or output transistor short out. In normal operation, the current through the resistor should not exceed 100 milliamperes. This resistor along with ferrite beads and the short length of coaxial cable (approximately 60 pf) provides filtering; keeping the drive RF from effecting the modulator should the SWR on the amplifier input become excessive.

The output transistor Q9 is capable of 150 watts dissipation, 15 amperes of current and will pass 30 mhz with a current gain of ten. Since all of the plate and grid currents flow through Q9, a 15K, 2 watt resistor is all that is required connected from the 170 volt supply to the emitter to keep the transistor conductive. I use a 1 ½ x 1 ½ x ¼" aluminum angle as the heat sink to cool Q9 which at maximum power output levels requires 100 watts



of cooling. Air cooling is provided by the plate cooling fan since heat sink is secured to the bottom of the plate compartment. Attached to the emitter follower of Q9 are a 10 k ohm resistor and a .001 mfd ceramic capacitor which is used for checking waveform and bias voltage, values which can approach 200 volts peak. It is not necessary to use feed thru capacitors since the transistor is rated for 200 volts of RF. Feed thru capacitors will only reduce the high frequency response of the modulator. A filament transformer filament winding having less than 100 pf to ground and other windings, is recommended. Make certain to use the normal RF chokes and beads as indicated for added protection.

A push-to-talk circuit is used to clamp the video signal during the receive mode otherwise, at high modulation levels, the tube will conduct which may cause "hash" in the received signal. The bias range, for linear operation SSB, can be set for a minimum of 25 volts which, at a plate voltage of 3500 volts, the idling current is around 220 milliamperes with the PTT contacts in the open position. When the PTT contacts are closed the standby bias is 80 volts, making the tube non-conductive so not to cause hash on the received signal.

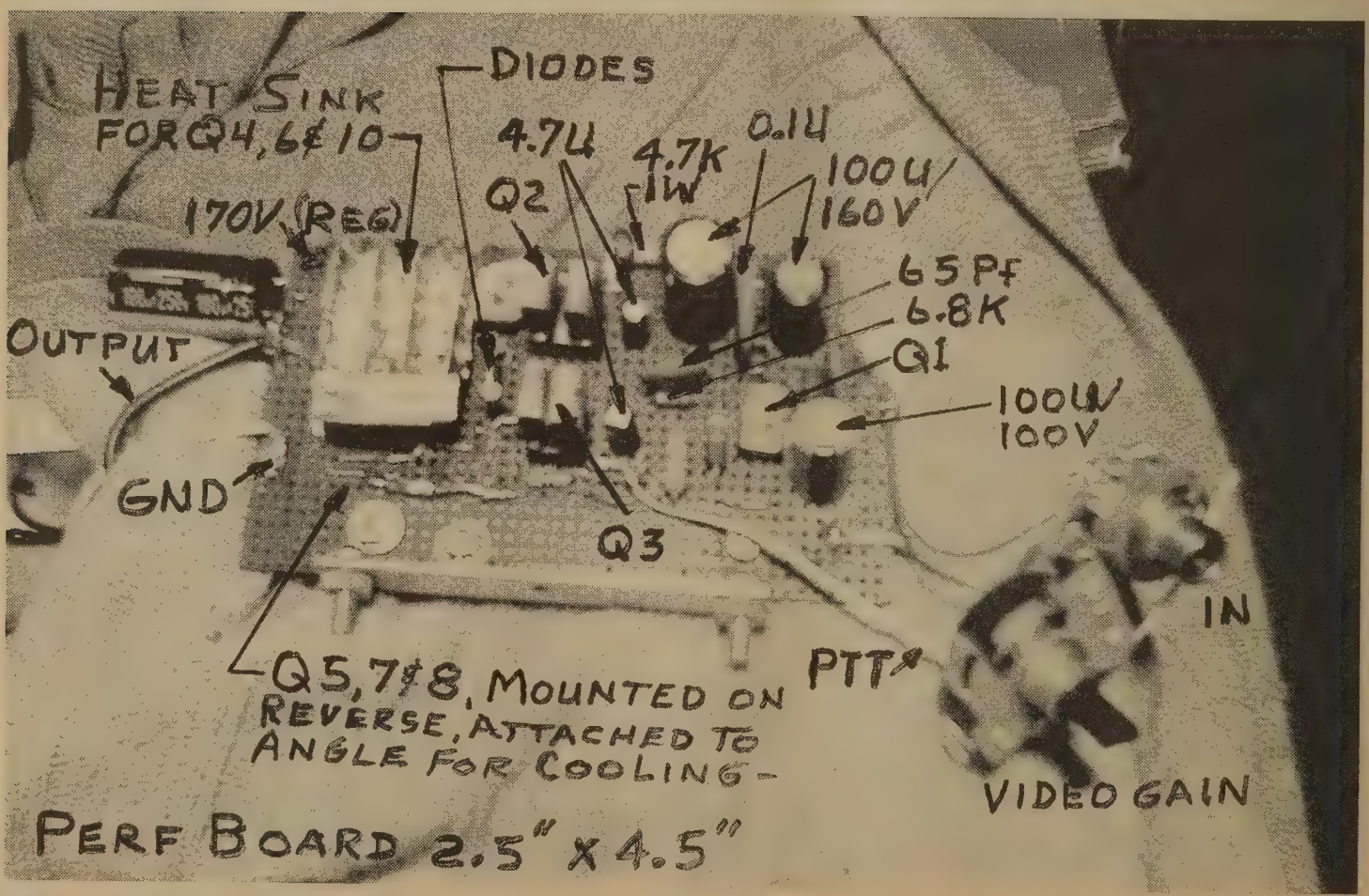
This modulator has been thoroughly tested at the 500 watt average output level, (Bird Watt Meter Reading), many times running continuously for four straight hours. Operating continuously at higher power levels causes "N" connectors to overheat and fatigue. UHF connectors will accommodate higher power levels on 70 cm, although not recommended.

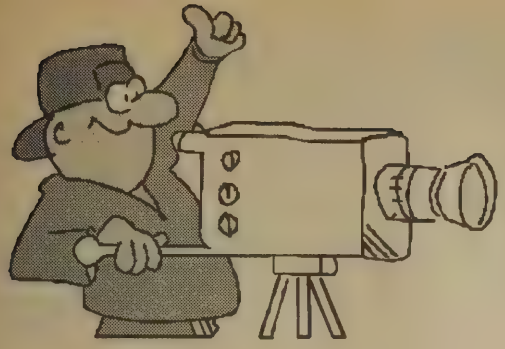
If you want to work ATV DX this seems to be a fairly easy way to do so. Just remember, Linear Tube Type Amplifiers have deadly high voltages, so CAUTION must be employed at all times!!!

Good Luck and Happy "DX"-ing!!

WA9EUN
Dwight Raddatz, P. E., Ph.D.
dbraddatz@netzero.net

ATVQ





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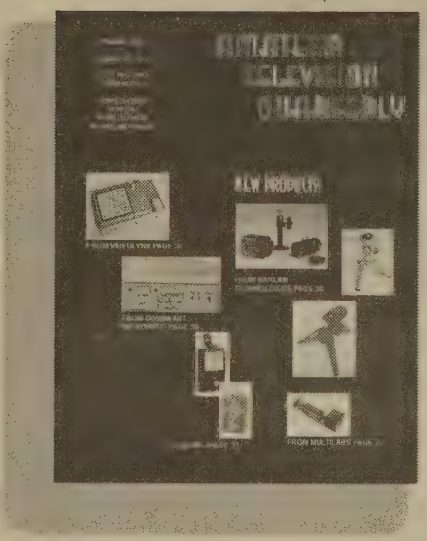

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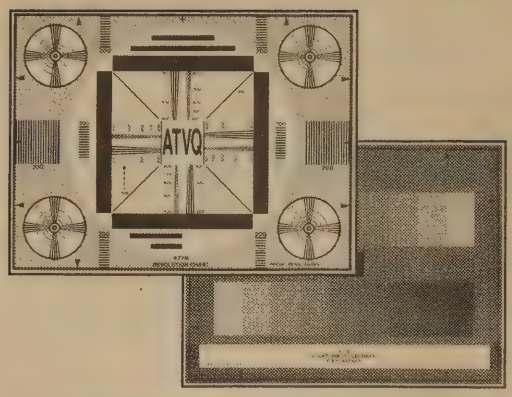

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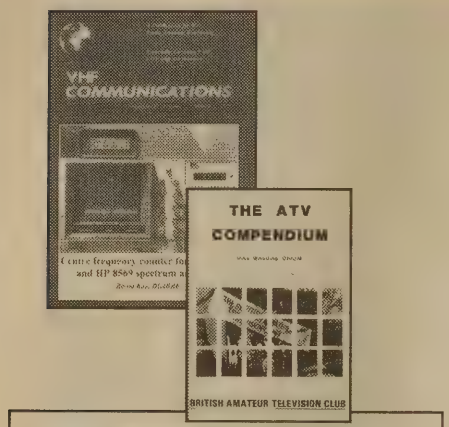

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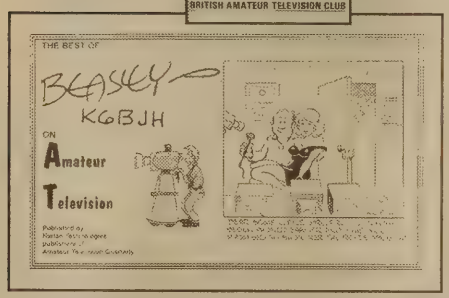

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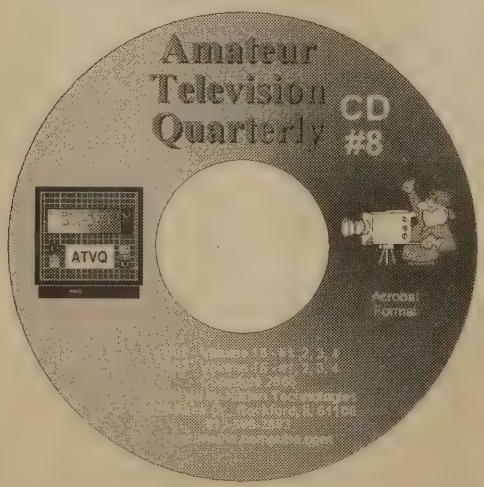

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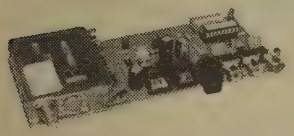

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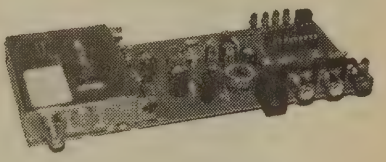

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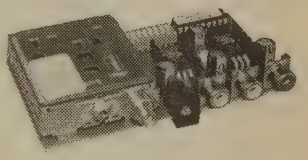

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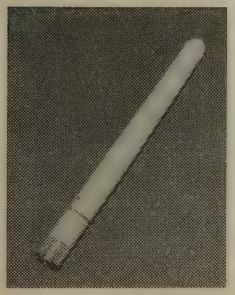

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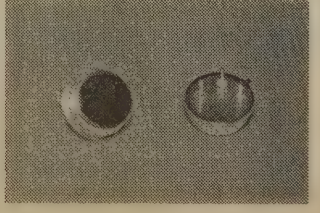

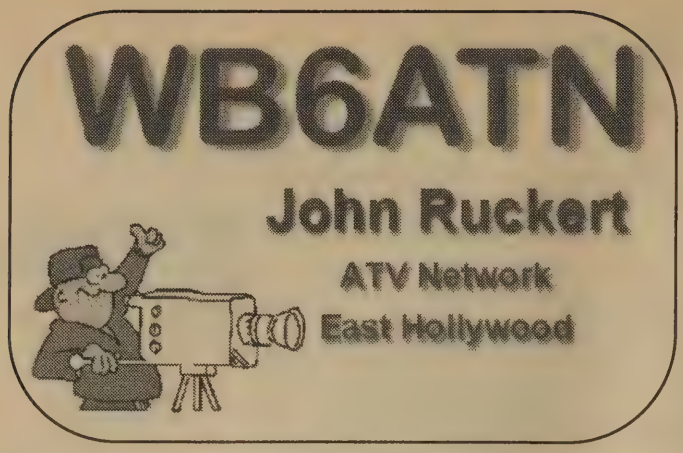

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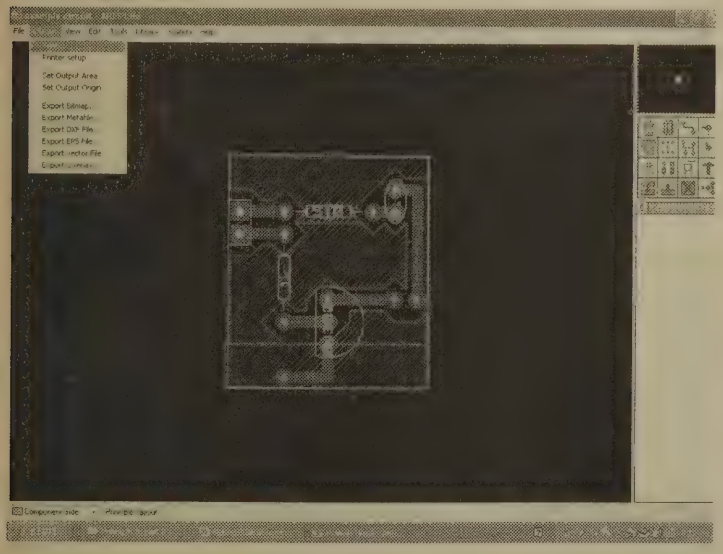
Making Printed Circuit Boards At Home - Part 2

By Paul Verhage - KD4STH Email: Paul.Verhage@boiseschools.org
5720 3rd Ave.
Nampa, ID 83686

The last issue of ATV Quarterly described how to use the software Are Lite to design a simple printed circuit board or PCB. Now that the designing of the PCB is complete, let's create a real product. First, save your file, then load a transparency into your printer. I use a laser printer because I believe it creates crisper edges than an inkjet. However, you'll want to test this hypothesis before deciding you can't use an inkjet. On the transparency, we're going to print a mask of the bottom copper layer. If you're not familiar with PCBs, you should know they can have many layers with each layer a specific pattern of copper traces. Copper traces are the etched copper lines that electrically connect the leads of components like resistors. Soldering components to a PCB is how they are electrically and mechanically attached together to form a durable circuit. The PCB we're about to create has just two layers, a top layer, or top silk, where the components reside and a bottom layer, or bottom copper, where the copper traces are located.

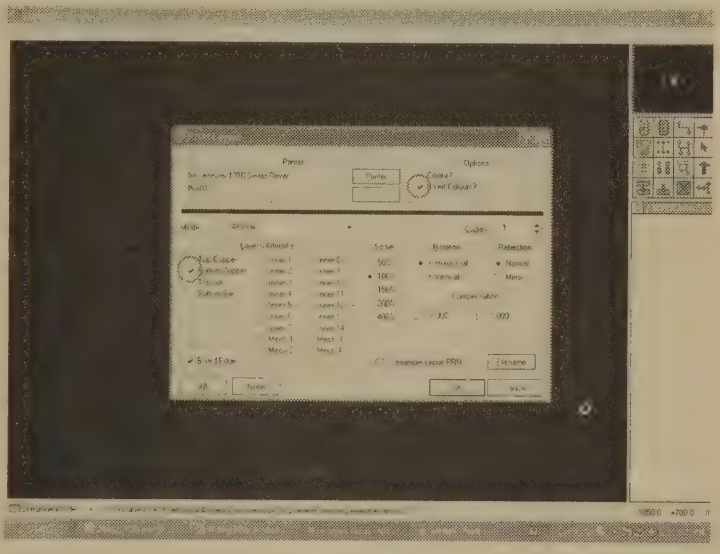
Printing the Mask

To create the mask of our PCB's bottom copper layer, click Output in the top menu bar and then select Print in the drop down menu. You'll be looking at a screen similar to this one below



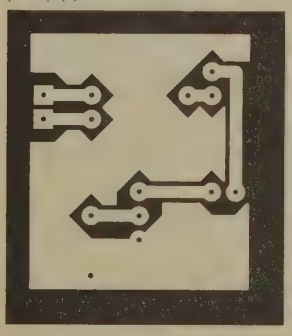
The print screen in Ares Lite.

As you can see in the next screen shot, the Print menu has lots of options, but we only need two of them. That's to select the proper layer and to print it in inverted colors. The second print screen looks like the one below. The options we need to select are located in the Layers/Artwork menu and the Options menus and circled below.



The second and final print screen in Arte Lite.

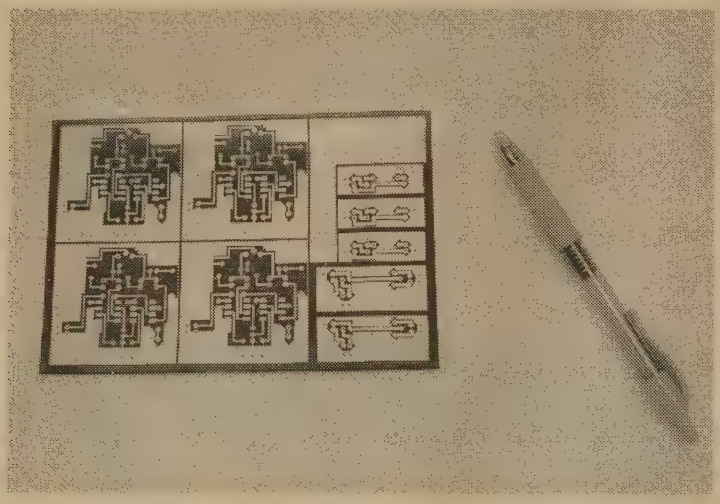
Under Layers/Artwork, select the Bottom Copper option and unselect any other options, except for the possibility of Board Edge. This option appears to make very little difference in most of my projects, but can be useful when I print several PCBs together on a single board. In the Options menu, select the Invert Colors? option. This will produce a mask where the copper traces and plains are transparent and etched areas are black. This is necessary because the resist on the pre-sensitized boards we'll use require negative exposure. Now click the OK button to print the mask. The bottom copper mask will look like the one displayed below.



An example of a very simple inverted color copper mask.

You can see this design has six copper traces (white in this image) and lots of ground plain. Where the mask displays white, the PCB will be copper. The black areas will be etched on the final board and devoid of copper. The ends of the traces end in pads where you'll drill holes to insert component leads (wires). The next picture is a solder mask

printed on a transparency. To eliminate wasting area on a pre-sensitized board, the example mask contains several PCBs combined into a single 4" by 6" mask. After developing, etching and drilling the board, it was sliced into nine separate PCBs.

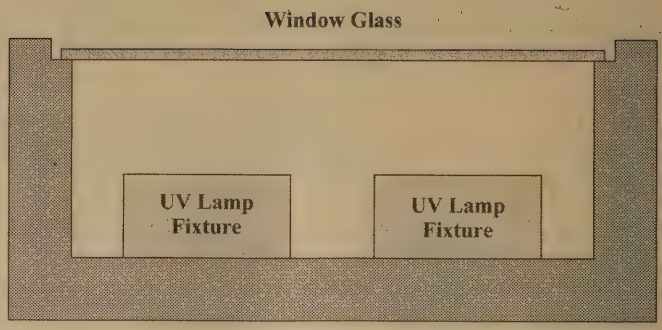


A transparency fresh out of the laser printer.

The UV Table

The DALPro boards we're using are pre-sensitized. In other words, they arrive from DALPro covered in a thin layer of resist (it looks like a very thin plastic coating on the copper side of the board). Don't confuse the resist for the plastic sheet that protects the board from scratches. The resist appears to be a hardened layer of ultraviolet sensitive resin. Without exposure to ultraviolet, the resist will dissolve off the board when it's developed. However, where ultraviolet light shines on the resist, the resist hardens and cling to the board. To transfer the copper traces from the transparency to the board, we'll shine ultraviolet light through the mask and on to the board. Because of this photo-transfer method, there is no issue of bad transfer that can occur with iron transfer methods.

The ultraviolet table where the board is exposed is essentially a light box. Inside are two or three fluorescent light fixtures with their light bulbs replaced with ultraviolet lamps. The proper bulbs are marked F15T8-BL and they replace the white light fluorescent bulbs that will come in the fixtures (don't use the purple colored black light bulbs marked F15T8-BLB). The proper UV lights are available at many lighting stores. The fixtures are inexpensive and available from many home improvement stores and big box retailers who sell them for under counter lighting. Screw the light fixtures to the inside of the UV table and drill small holes through the side of the table where the power cords from the lamps can exit the box. Be sure you turn the lights on at this point, as you use a power strip to control the lights. If the lights aren't switched to the on position, you'll be unable to operate the table.

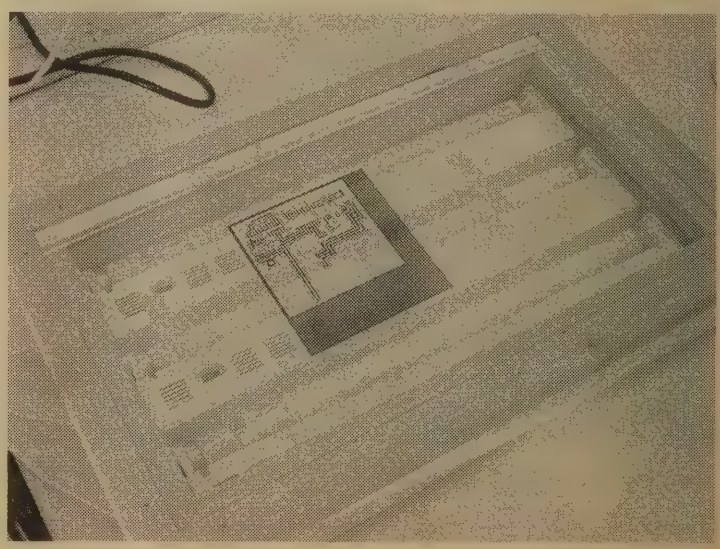


Cross section of the UV table. Notice that the edge of the glass is recessed to protect fingers. The box doesn't need to be very deep. Just deep enough that the lights can shine ultraviolet upwards without casting shadows on the mask and PCB.

The ultraviolet table is pretty simple, it's a wooden box painted white inside to reflect ultraviolet light and covered in a sheet of glass. To protect your fingers from sharp edges, recess the glass into the box or attach a wooden bead around the top edge of the box to prevent your fingers from coming in contact with the glass edges. A few drops of silicone glue are sufficient to hold the glass in place

Shooting the Board

To protect the pre-sensitized board from undesired exposure to ultraviolet light, the exposure needs to take place in a darken room. A little light filtering in doesn't seem to harm the board, but just the same, keep the room as dark as you can. I find bathrooms are great places to shoot PCBs as long as they don't have outside windows. A good source of safe light is a yellow bug light. Rather than exchanging a white light for a bug light every time I want to shoot a board, I use a clamp-on light fixture for the yellow bug light. DALPro boards are not sensitive to yellow light, so you'll have enough work light with a yellow bug light.



A PCB mask taped to an ultraviolet table.

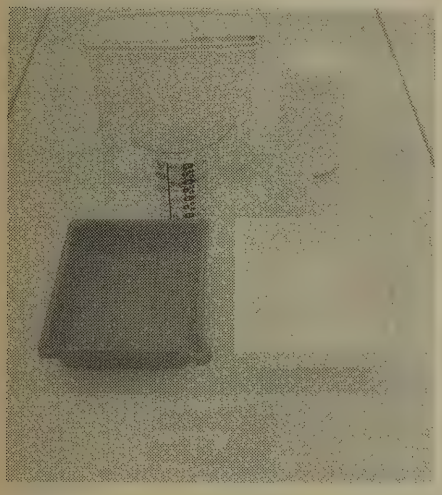
Tape the mask (transparency) to the glass with the ink side of the transparency up. If it's taped to the glass with the ink side

down, the final PCB will be backwards and not work. You can tell the inked side because light doesn't reflect off the ink, making it look dull. Just use two pieces of tape, you just need enough to prevent the mask from sliding around. If it's not already on, turn on the bug light and turn off the white lights. You can now safely cut open a bag of boards (I purchase bags of six single sided boards measuring 4" by 6" (DALPro part number DF1-466G). Their bag is black plastic and protects the boards inside from the light. Therefore, you should cut the bag open on one side so the other side can fold over and be taped closed. After cutting open a bag of boards, I recommend storing the bag in a dark box between uses.

Look at the board under the yellow light. You'll see that one side is epoxy circuit board and the other is shiny copper covered with a thin sheet of plastic. Do not peel the plastic at this time. It must remain adhered to the board without wrinkles or it won't let UV fully shine on the resist layer beneath it. Place your board over the mask copper side down. Use two more pieces of tape and tape the board in place. Again, the tape is not to hold the board down, but to prevent it from sliding around. Cover the glass on the table with a sheet of thin black poster board. Use thin poster board and not corrugated cardboard because you want to feel the board beneath the poster board covering the table. Press the corners and center of the board firmly against the glass (and the mask) and turn on the lamps for a one minute exposure. After exposing the board, remove it from the UV table and store it in the dark for 15 minutes.

Developing and Etching Boards

You'll note the board was exposed like a photographic contact print. Similar photographic principles apply for the rest of the process. We'll use chemicals and photographic trays to develop the exposed board in washing soda and etch it sodium persulfate. The developing process must take place under the yellow bug light, but the etching can be done under regular house lights. You'll need measuring spoons, a small measuring beaker, and two plastic 4" X 6" photographic trays to finish processing the boards. Use small 4"X 6" trays to develop and etch the board or you'll waste too much developer and etchant trying to cover the board in solution. The photograph below shows what I typically use to process my boards.



Kitchen tools and photographic equipment, the extend of the stuff you need to process an exposed board. The big pitcher is so I can bring lots of hot water to class to process boards.

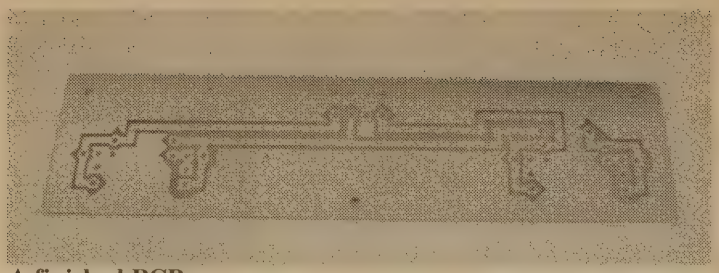
DALPro sells the developer and etchant, so you don't need to find a local supplier. Make developing solution by adding one teaspoon (5 mL) of washing soda to 150 mL of warm water into a clean tray. Dissolve the washing soda thoroughly before developing the board. Also, keep a paper towel handy to remove any stubborn resist. After the board has sat in the dark for 15 minutes (so the resist can finish hardening), remove the thin plastic sheet from the face of the board and place it into the developing solution. As you place it in the tray, you'll notice a faint pattern "sunburned" into the resist. Gently shake the tray for a few minutes and you'll see that the resist is turning a dark purple (actually it's blue under white light) in places and lifting off in other places. The resist remains where copper traces will be on the finished PCB. If after a few minutes there's resist that hasn't lifted off, dip the paper towel in the washing soda solution and gently wipe the last bit of resist off the board. After the developing is complete, remove the board from the solution and rinse it well under running water. Save the tray of washing soda for later use. Now you can turn on the lights.

The etchant solution consists of one teaspoon and one tablespoon (20 mL total) of sodium persulfate and 100 mL of warm water. Again, use a small 4" by 6" tray to minimize the amount of etchant needed to cover the board in solution. Place the developed board into the etching solution and gently shake the tray. The longer you shake the etchant tray, the faster the board will etch. So keep the tray moving. To protect your eyes, wear safety glasses or goggles while you shake the tray. The first thing you'll notice is the shining copper is becoming dull (I think it looks a peach color). That's the copper's surface being etched away. It takes around 20 minutes for the board to etch, but your time will vary based on the amount of shaking and the water temperature. When the board is finished etching, dump the etchant out (dumping it down the sink followed by water seems to be safe). Wash any etchant off your hands and clothes. Sodium persulfate is a much nicer etchant than ferric chloride, but nonetheless it can bleach clothing, so clean up after you're finished etching.

Remember that developer solution? Now's the time to use it. Return the etched board to the developer and after about 20 minutes, the rest of the resist will have lifted off the etched PCB exposing a beautiful pattern of shiny copper. Remove the PCB and rinse it thoroughly again. I flush the developer and resist down the toilet to it can't clog the sink.

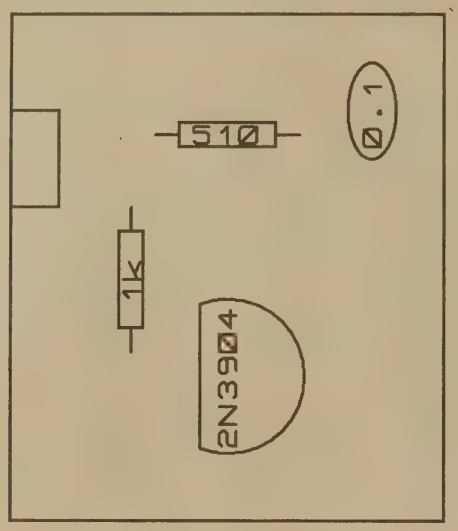
Finishing the PCB

After drying the board, you can drill the holes in it. A Dremel and small drill press works well for this process. To protect the top silk side of the PCB, place a sheet of paper down on the drill press table first. This keeps the aluminum marks off the face of the finished PCB. Carbide drill bits are the only drill bits you should use. Regular tool steel bits will dull too soon and begin melting holes through the PCB rather than cut them. By the way, the drill bits are available from DALPro and occasionally from surplus electronics stores.



A finished PCB.

While it's outside the scope of this article to describe how to solder a PCB, you will need information on how components will fit on the PCB. Therefore, in Ares Lite, print out a copy of the PCB's top silk. Top silk is that documentation you wrote on your PCB design so you wouldn't forget which component fills each drilled hole in the PCB and its proper value. To print it, go back to Output on the top menu bars and click Print. However, this time, just select to print the top silk and don't invert Colors. Now click the Print button and you'll have a print out of the placement of components on the PCB.



An example of the top silk for a PCB. This is the information you need to complete your PCB.

That's it. You can now make you own PCBs. The process is simple and enables you to make hundreds of PCBs. It's so fast and simple that you'll never want to go back to perf board again. Using this process, I've turned an idea I had driving home on a Friday night into a complete project before going back to work on Monday.

Onwards and Upwards,
Your Near Space Guide

ATVQ

Don't Get Suckered On Wireless Mics

In case you haven't heard, wireless mics on 698-806 MHz are illegal and none can be used after Feb 18th, 2009. I am sure a lot of stuff will be dumped on Ebay et al. Yeah, even those expensive systems sold by Sony, Sennheiser, Shure EV, and others are all dead meat. You might want to alert your local non broadcast users (church's, DJ's, free-lancers etc) or help them check the frequency of their devices.

Henry - AA9XW

ATVQ

Kentucky Space Balloon 1 Flight Recap

Date: Wednesday, July 16, 2008

The Kentucky Space balloon flight 1 went beautifully. This was Kentucky Space's first balloon mission payload NSB-1, built by students from several KY universities and colleges. It had APRS on KI4KXM-11 and a 433.84 MHz CW telemetry beacon onboard along with two Canon 570IS cameras which took some amazing photos.

The 1.257 GHz FM ATV transmitter worked just great (thanks to the wee hour payload-building efforts of Hank, W4HTB, and Shane, N4XWC) with snow-free video received at our command center throughout most of the flight. I also had WB8ELK-11 on APRS. Reception reports of the video signal were received by KA9UVY in Mt. Vernon IL, W8RVH in New Carlisle, Ohio and W8ZCF in Cincinnati, Ohio.

The simplex repeater on 144.34 MHz was quite busy with stations working through it from IL, IN, OH, KY, TN, AL and GA. We even had a few mobile stations from 200 plus miles out working through it. The repeater was an Alinco DJ-S11T (modded with a half-wave dipole) and a Radio Shack Simplex Repeater module.

The balloon reached 91,277 feet and landed southeast of Scottsville, KY in a field near a house (36.6774 -86.1376) The owner called me a few minutes after spotting the payloads across from her driveway and the student teams arrived a few minutes later in hot pursuit.

The National Guard and EMA folks brought out their emergency communication vehicles and we had a first rate air-conditioned ground station with every conceivable HF and VHF radio for our use.

Bill - WB8ELK

ATVQ

Build a 1.2 GHz Transceiver Using Comtech Boards

By John B. Watson, NY3K, Email: NY3K2004@Yahoo.com
Laurel, Maryland

Preliminary Considerations

In a previous article in ATVQ, I wrote about constructing a 1.2 GHz link for your local ATV repeater centered around a Comtech transmit board. The way the link I described is set up, you only have the ability to transmit video to your local repeater on 1.2 GHz. There was no receive capability on 1.2 GHz. Given that the transmit board is connected to a very good antenna system (albeit pointed at the local repeater), I have often wondered what it would take to couple a receiver with the transmit board so that I could receive video on 1.2 while the link was not transmitting. I thought about substituting a 1.2 GHz ATV transceiver for the Comtech transmit board. However, there does not appear to be anyone out there making such a radio. So, I sat down and designed a simple transceiver of my own based on the Comtech boards which I present in this article.

Parts List

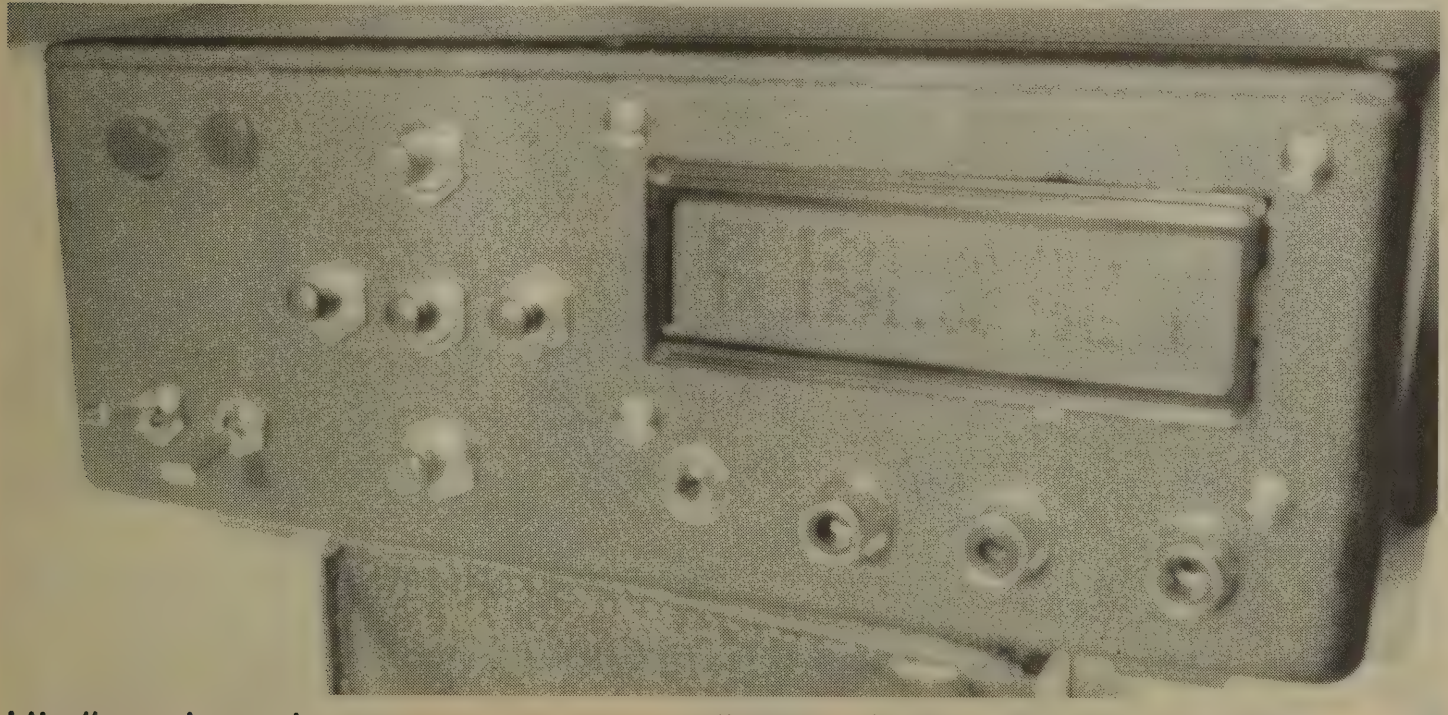
I like a list of parts up front when I consider building a project I see in a publication. It tells me where the parts can be purchased and gives me a good idea as to the feasibility of me jumping into the project. So, at Figure 1, I have included a parts list, with the source for the parts I used. Please keep in mind that part numbers and sources may change over time so be flexible.

Acquiring the Comtech Transmit and Receive Boards

The Comtech boards may be acquired from several sources. Some are as close as this publication (**http://comtech.hampubs.com/**) or as far away as The Hague (**www.Mobicomm.net**). Before Gene Harlan started being a vendor for the boards, I acquired a transmit and receive board from the Mobicomm folks and those are the boards used in my project. If I need to purchase additional boards in the future, I must say that Gene's prices including shipping are hard to beat.

Acquiring the Digital Display

As best as I can tell, the digital display for the Comtech boards can only be acquired from the Mobicomm folks. (See **www.stores.ebay.com/MobiComm**). Mobicomm states that while its digital display "product will allow the control of Comtech transmit and receiver modules, it may also control modules from other manufacturers which use the TSA5055 or SP5055 PLL I/Cs." What you get from Mobicomm is a circuit board, a pre-programmed PIC16F688 with latest V4.10 Firmware (as of the date I wrote this article), and a parts list for populating the board. The parts list gives the order codes for all the parts necessary from any of three different sources (Mouser, Digikey and Farnell). (See **www.mobicomm.com/store/OrderCodes.pdf**.) I acquired all the parts needed from Mouser. However, as I explain further



below, I modified the construction of the board somewhat to fit the transceiver concept I discuss here. This did not involve acquiring any additional parts, only the placement of the display module away from its circuit board.

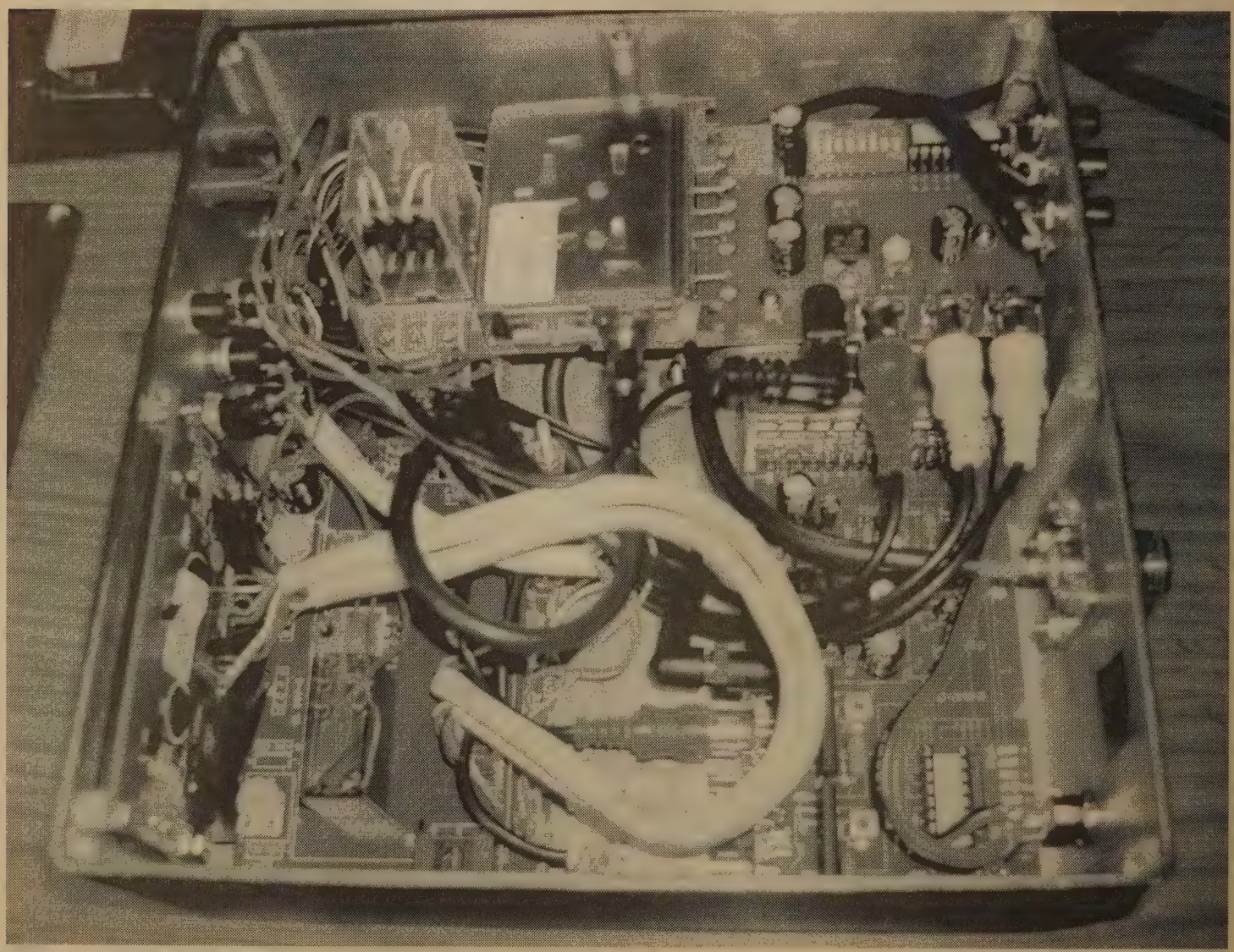
The digital display is a nice package. It shows the transmit and receive frequencies of your radio, as well as has an S-meter to show received signal strength. It also saves your information in a non-volatile memory. If you hook up the digital display directly to your Comtech boards (which I will do as the next phase of my project), it controls the frequency of those boards directly, as well as powers them from the digital display board.

Relay for Switching Between Transmit and Receive Boards

The design I arrived at for my transceiver uses a four pole, double throw, 12 VDC relay to perform a number of tasks. First, the relay is powered by 12 VDC and provides continuous DC voltage to the digital display as long as the transceiver power switch is turned on. Second, the relay provides DC voltage to the receiver board when in receive mode, and alternatively, DC voltage to the transmit board when in transmit mode. When either board is not in use, the DC voltage to that board is turned off. Third, the relay takes the antenna jack center pin and directs it to the receive board when in receive mode, and alternatively directs it to the transmit board when in transmit mode. The relay also controls the indicator lights: the receive light is on when the unit is not transmitting, and the transmit light comes on when it is transmitting. In Figure 2, I set out what each pin of the relay is connected to and how to hook up the switches,.

Essentially, the relay accomplishes the following. When the transceiver is switched on, power flows to the digital display board, the receive board, and the On/Off indicator bulb. At this point, the antenna is fed to the receive board. When the transmitter switch is activated, power still flows to the digital display board, but power is switched to the transmit board from the receive board and to the transmit indicator bulb from the On/Off indicator bulb. The antenna is also switched from the receive board to the transmit board.

I have only used three of the four relay poles in my transceiver. This leaves one pole open for future additions to the project.



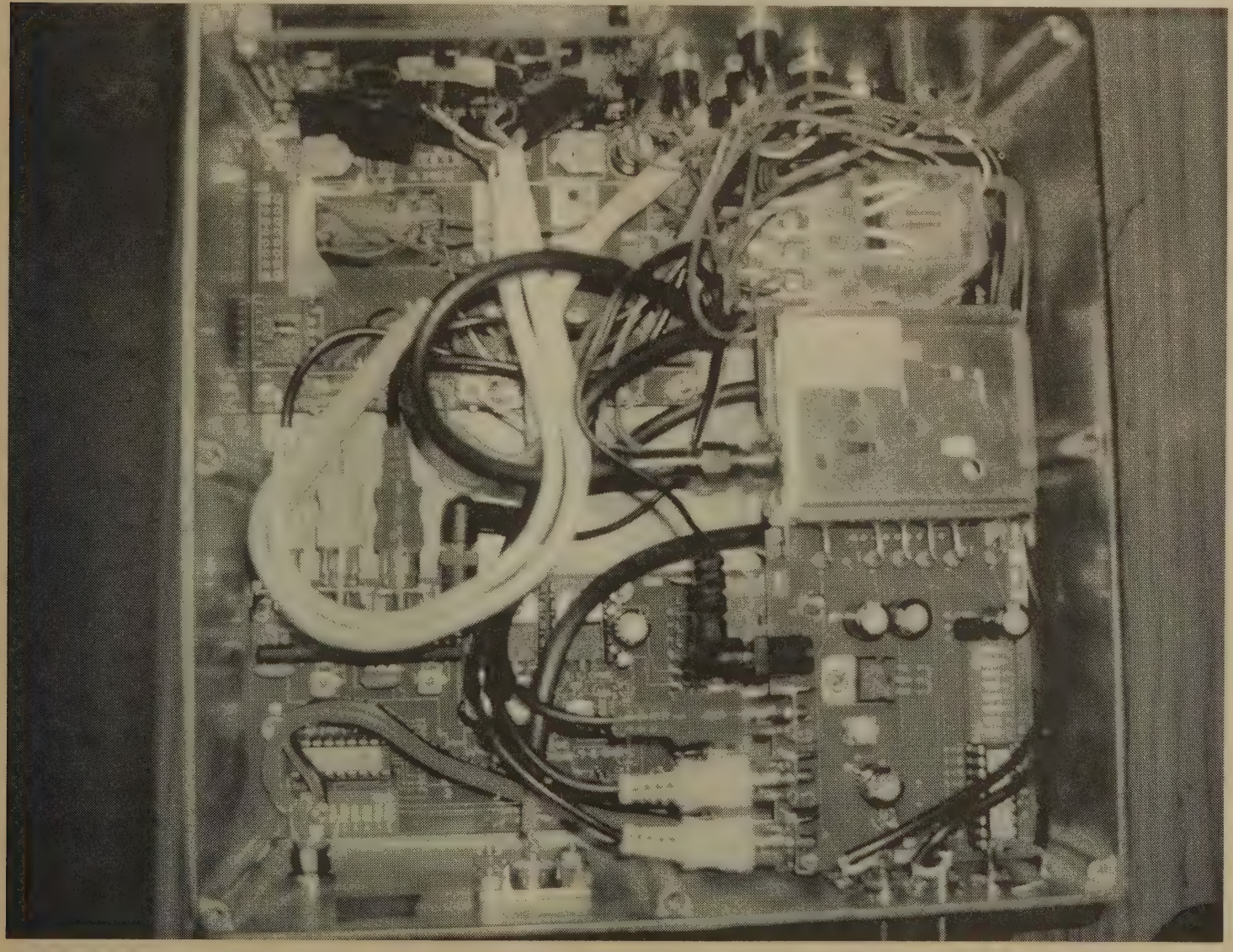
Relay for Push-To-Look Circuit

For anyone who does not know, a push-to-look (PTL) feature on an ATV transceiver allows the transceiver to be keyed electrically without the need to manually throw the transmit switch. PC Electronics (see www.hamtv.com) ATV transceivers in the recent past have had PTL inputs on the front. This is very useful when you have a device like an Intuitive Circuits ATVC-4 Plus ATV Repeater Controlled (see **www.icircuits.com/store/prod_atv_main.html**). When the ATVC-4 Plus sees a video signal, it keys the repeater transmitter to send it out. It does so using a PTL circuit which simply brings an output to ground which, in turn, causes the transmitter to transmit.

Therefore, in my transceiver, I use a miniature 12 VDC relay that operates only when it is brought to ground by the PTL impulse from the ATVC-4 Plus controller (or any other device that works the same). The + 12 VDC is always present on the relay. The relay will operate when it receives the – 12 VDC from the PTL impulse to complete the circuit. When it receives this negative voltage, the relay closes and causes the transceiver to transmit the same as if you manually throw the transmit switch. The relay is connected to the same two terminals as the manual switch. In Figure 3, I set out what each pin of the PTL relay is connected to.

Mounting the 1.2 GHz Boards, the Digital Display, and the Relays

The key to mounting all your boards and hardware is to have a container that is of the right size, and which can be drilled and fashioned to your design with ease. I did not try to reinvent the wheel here. Tom O'Hara, of PC Electronics, has done all the work to fashion a beautiful 70 cm ATV transceiver, the TC70-20SA, which I have clearly copied to some extent for my 1.2 GHz transceiver design. So the key is to acquire a Hammond 1590 F (black) aluminum box, the same container that the TC70-20SA uses. I obtained mine from Mouser and it comes with a top and mounting screws. The neat thing about the Hammond container is that it is very easy to drill holes into for the fashioning of the transceiver. The aluminum is quite malleable and user friendly for someone like me who does not have a work bench, drill press or any other fancy metal working equipment outside of an electric drill and a hand file.



Next, you need to decide how the boards and relays will fit in the container all together. I found that that if I placed the transmit board partially above the receive board, I would have plenty of room for all including the digital display board and the relays. (See picture included with this article.) I first mounted the receive board on the back floor of the container using nylon spacers to prevent the bottom of the board from coming into contact with the container itself. Given that the transmit board is relatively light, I found that I could mount it using two ½ inch wide "Z" shaped pieces of aluminum which I made from stock I found in my garage. The bottom of the "Z" screws to the base of the Hammond container, and the top screws to the transmit board again offset by nylon spacers. For both boards, you will need to find spots on the boards that will take a 1/8 inch drill hole without destroying any of its circuitry. There are ample spots available.

Next, I mounted the digital display circuit board, sans digital display, on the base of the Hammond container near the front again using nylon spacers. The manual for the digital display kit directs that you are to mount the display itself onto the front of its circuit board. However, I found that this would make it almost impossible to mount in the Hammond container and still have the digital display viewable from the front of the closed container. Therefore, I used 24 gauge wires to put some distance between the circuit board and the display itself so I could mount the display on the front of the transceiver and its circuit board on the inside floor of the container.

The four pole, double throw relay seemed to fit nicely up near the front of the transceiver container as you can see from the picture included with this article. The PTL relay has a non-conductive housing, so I decided to Super Glue it in the open space of the digital display circuit board. It fit there nicely with no problems.

Mounting the Input, Output, and Switching Hardware

Certainly, how you set up the front side "look" of your transceiver is 100% up to you. Beauty is in the eye of the beholder. I placed the on-off switch and transmit switch and indicators for both on the left front of the transceiver, and the video/audio inputs and PTL input on the right. I also placed the digital display on the right upper side of the container and five momentary switches to control the digital display board in a cross-type pattern on the left center. These switches are wired to those on the digital display board and duplicate their function, but are accessible from the front of the container rather than the circuit board inside. On the back of the container there is a female "N" chassis mount as well as video and audio out connectors and a DC input chassis mount. I have included in Figure 4 the size of the drill bits I used for drilling the holes for the various hardware.

Indicator Lights

I liked the indicator lights that Tom O'Hara uses on the TC70-20SA so I also followed that pattern here. However, when I tried to purchase a green indicator cover for the bulbs to mount above the on/off switch (like Tom uses), I was told that I would have to purchase like 30,000 of them from Mouser at a time. No thanks, I'll just use red for both the on/off and transmitter indicators. You could purchase red in any quantity, like two which I did. I used the same 12 VDC Xicon lamps that are used in Tom's rig in mine as well. (I describe how the indicator lights are connected in Figure 2.)

Other Considerations

My design uses a 50 – 70 mW Comtech transmit board which works fine to excite my 30 watt Downeast Microwave (see www.downeastmicrowave.com) linear amplifier (Model 2330

PATV). However, you could also vary the transmit power by using a 1-watt board (with heat sink, thank you) available from Mobicomm, or even installing a brick and getting much higher power from your transceiver. You could even consider installing a preamp circuit in your transceiver to improve the receive, if necessary. (Mobicomm tells me that such a preamp is in the works on their end.) I would love to hear from you with any additional ideas that you might have so I can try them out.

Conclusion

The design above did not take a lot of "know-how", but it does take some skills in metal working which I (obviously) wish I was better in doing. As I have always said, when my father was teaching shop in our house, I was always doing radio. I learned CW very well, but cannot drill two holes that are exactly evenly spaced for the life of me (as is obvious in the pictures). Your version of this transceiver will be much prettier than mine I am sure.

Please email me with any ideas, revisions, criticisms, etc. on this design. Thanks for reading.

Figure 1—PARTS LIST

Quantity	Part Name	Part Number	Source
1	Hammond Black Box	546-1590F-BK	Mouser
1	Comtech 1.2 GHz Receiver	DFM1200RTIM	See Article
1	Comtech 1.2 GHz Xmitter	DFM1200TSIM	See Article
1	Digital Frequency Display Kit		Mobicomm
—	Parts to Populate Display Kit		See Article
1	4P DT 3A 12 VDC Relay	NTE R12 1703-12	Mark Elect.
1	14 Pin Relay Socket	NTE R95-117	Mark Elect.
1	DP DT 12 VDC Relay (PTL)	RS-275-249	Radio Shack
5	NO Momentary Switch	RS-275-1547 (4 PK)	Radio Shack
2	Mini Toggle Switch 6A 125 VAC	RS-275-635	Radio Shack
2	Red Xicon Lamp Holder	35LT001	Mouser
2	Xicon Lamp 12 V .035A BLU	35LS124	Mouser
6	Panel Mount RCS Phone Jacks	RS-274-346	Radio Shack
1	1/8" Panel Mount Audio Jack (PTL)	RS-274-249	Radio Shack
1	Female "N" Chassis Mount		Mark Elect.
1	DC Chassis Mount	RS-274-1582 or 3	Radio Shack
3	DC Power Plug/Cable Assy		Mark Elect.
3	Shielded Cable w/ 2 RCA Jacks		Mark Elect.
1	2 Feet Shielded Coax-50 Ohm	RG-58U	Mark Elect.
2	SMA Male Connector for RG-58U		Mark Elect.
1	Package of 4-40 ½" Screws (20)		Home Depot
1	Package of 4-40 nuts (20)		Home Depot
1	Package of 4-40 Lock Washers (20)		Home Depot
1	Package of 4-40 1" Screws (5)		Home Depot
	4-40 ¼" and ½" Nylon Spacers		Home Depot
	Hookup Wire (24 Ga works fine)		
1	Package Self-Stick Cushion Feet	RS-64-2342	Radio Shack

Figure 2—4P DT RELAY WIRING INSTRUCTIONS

(11) (12) (13) (14)

(7) (8) (9) (10)

(5) (6)

(1) (2) (3) (4)

Relay Pin Numbers

Pin # Connection

(1) Center of "N" Antenna Chassis Mount Connector
(2) -12 VDC Input. Also directly wire to Pin 5. Also -12 VDC output to the Digital Display Board
(3) Open
(4) +12 VDC is fed first to the bottom pin of the On/Off Switch of the Transceiver then Pin 4 is connected to the center common pin of the On/Off Switch. When the switch is turned on, +12 VDC flows through the switch to Pin 4. Pin 4 is also connected to the +12 VDC of the Digital Display Board.
(5) Connected directly to Pin 2
(6) The bottom pin of the Transmit Switch is connected to the center common pin of the On/Off Switch. The center common pin of the Transmit Switch is connected to Pin 6. When the Transmit Switch is turned on, +12 VDC flows through that switch to Pin 6, which in turn causes the relay to key.
(7) Center pin of the antenna on the receive board
(8) -12 VDC for the receive board. Also connected to one wire of the receive bulb.
(9) Open
(10) +12 VDC for the receive board. Also connected to the other wire of the receive bulb.
(11) Center pin of the antenna on the transmit board
(12) -12 VDC for the transmit board. Also connected to one side of the transmit bulb.
(13) Open
(14) +12 VDC for the transmit board. Also connected to the other side of the transmit bulb

Figure 3—DP DT RELAY WIRING INSTRUCTIONS (PTL)

(7) (8)

(5) (6)

(3) (4)

(1) (2)

Relay Pin Numbers

Pin # Connection

(1) Center of PTL 1/8" Audio Jack on front of transceiver
(2) Connect to Pin 6 of this relay.
(3) Open
(4) Open
(5) Open
(6) Connect to Pin (2) of this relay. Also connect to the bottom pin of the Transmit Switch which is +12 VDC when the On/Off Switch is turned on.
(7) Open
(8) Connect to the center common pin of the Transmit Switch

Figure 4—DRILL BIT SIZES FOR CONSTRUCTION OF TRANSCEIVER

Bit Size	Item to be Mounted
1/8"	4-40 Screws
1/4"	RCA Chassis Mounts. On/Off Switch. Transmit Switch. PTL Audio Chassis Mount
5/16"	Momentary Switches. Red Xicon Lamp Holders
3/8"	12 VDC Power Chassis Mount

ATVQ

FM ATV Transmitter Alignment Procedures

ATVQ Letters to the Editor, and Mike Collis, author

I would like to compliment Mr. Collis on a very well written article.

It has been a long time since anyone has written about FM ATV transmitter alignment procedures.

Back in 1994, I had written a couple articles: 'Comments on Commercial FM TV Standards as Applied to Amateur Operations' and 'Calibrate Your FM TV Receiver to Measure Video Deviation' which I have posted the original drafts on my website: **http://mathison.freeshell.org.**

These articles get into the nitty-gritty of just what 4 Mhz deviation means and what video content causes maximum deviation. There is also a description of a simple crystal controlled receiver calibrator to simplify FM ATV deviation measurements. Also included is my letter to someone who believed the 'crossover' of the 405-1 pre-emphasis network was at 762 Khz.

J. R. Mathison - WB9OQM

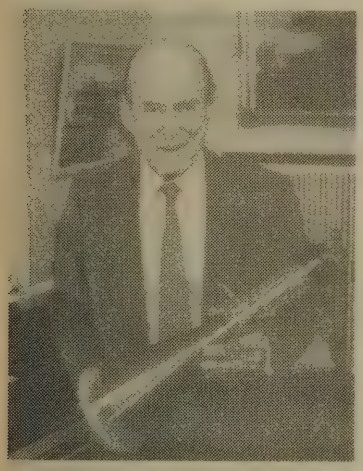
ATVQ

Developing All-Electronic TV - From Theory To Practice

Translation by: Klaus Kramer, DL4KCK

As an addition to the article by Paul Marshall in CQ-TV 221 about Campbell Swinton, the theoretical inventor of all-electronic television, I took some information from the book "Formation of Television" by Manfred von Ardenne, Germany (no longer available).

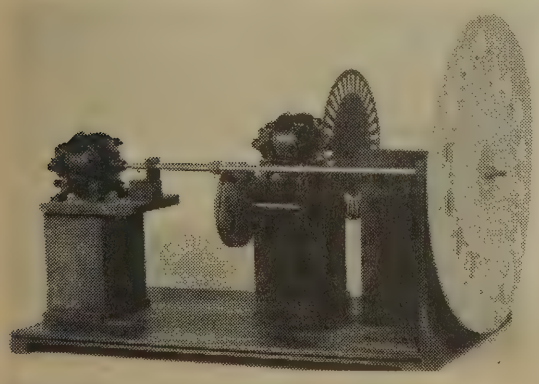
Prof. Dr. Manfred Baron von Ardenne was born 1907 in Hamburg, he registered his first patent (of around 600) at the age of 16 years. Some examples: 1926 triple tube for the LOEWE radio receiver, 1927 broadband amplifier (1 MHz), 1930 flying spot scanner, 1931 Berlin radio exposition - first public demonstration of all-electronic TV (100 lines), 1934 first all-electronic TV broadcast (180 lines), 1936 scanning electron microscope, 1945 obligatorily participation at sowjetic atom bomb development, after 1954 in Dresden development of oxygen and hyperthermal therapy on cancer, 1959 electron beam oven patented, 1977 proposal of 1250 lines HDTV, 1997 death in Dresden.



From the book´s preface:
"In the years between 1925 and 1930 I developed (under different objectives) the fundamentals of the television technology following later. On December 14th in 1930 these works found a conclusion in the invention of the flying spot scanner, when the first video transfer occurred with cathode-ray tubes at the scanner and the receiver side."
January 20th 1996, Manfred von Ardenne

Status of television in 1928

As a first great pioneer-action on the way to television we have to look at the transfer of video by mechanical image dissection with Nipkow disc and glow lamp by John Baird in 1924. But the picture quality was so modest that one could not think of television as an information broadcast medium.

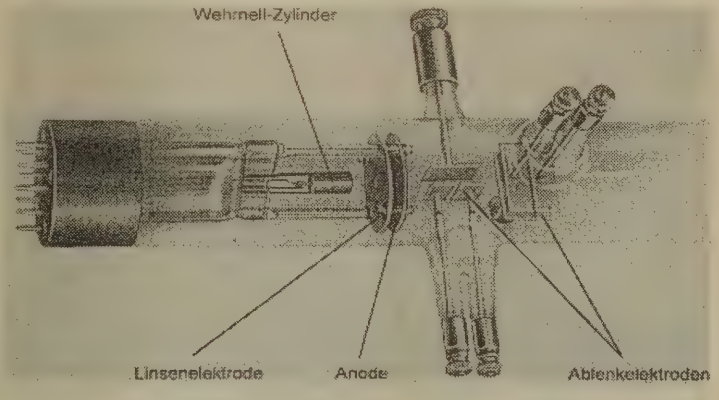


A very lucky circumstance for my realization of all-electronic TV afterwards was the fact, that I developed (under different objectives) the fundamentals of electronic television between 1925 and 1930. That were the first broadband amplifier, electron beam tube with a dimable bright and sharp luminous spot (both for oscilloscopes), high voltage power supply (with 3000 Volt and a negative bias voltage for luminance control) and sweep oscillators for synchronized frequencies between 5 and 5000 Hz (electrostatic beam deflection in x and y direction).

The trigger for all-electronic TV with all these elements was my invention of a flying spot scanner in December 1930 and my aggravation about an unfriendly rejection of my proposal for an undisturbed cost-saving radio broadcasting service on VHF in October 1930.

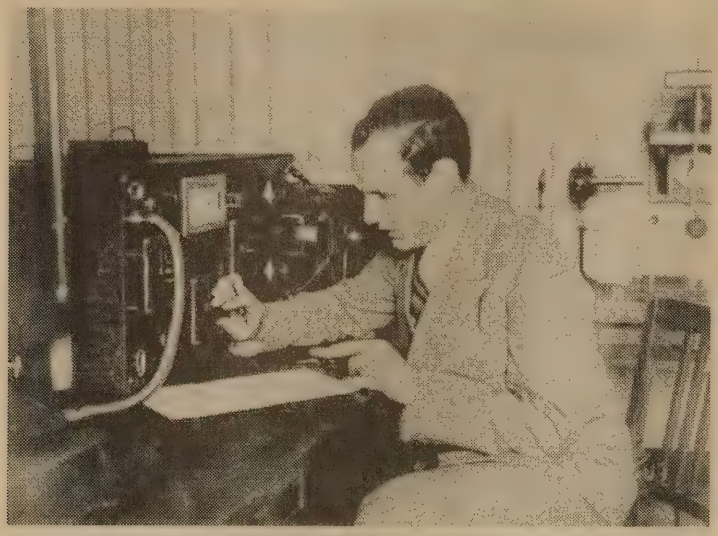
Fundamental elements

Objective of our development in 1928 at my Berlin-Lichterfelde institute was an electron beam tube with a very bright luminous spot of 1 mm diameter. Right at the start I had the idea to lead the electrons emitted from a nearly punctual oxide glow cathode through a negative biased cylinder to the sucking anode. In this electron beam orientation I saw the premise for getting a bright sharp luminous spot together with the sucking anode at several thousand volts (more than 10000 volts later in the flying spot scanner). Variation of the negative bias at the cylinder gave an option to alter the beam current nearly inertial-free. This paved the way for an element of brightness control in the following TV receivers. I named this cylinder "Wehnelt electrode" honoring my teacher at the Berlin university, Arthur Wehnelt.

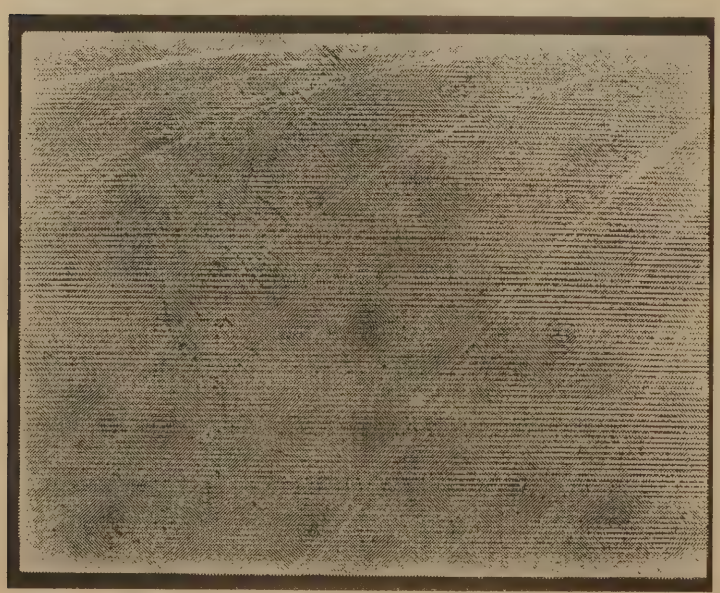


Another element of the electron beam tube is the beam deflection system. In our oscilloscope tubes for measuring purposes we used an electrostatic system with plate electrodes for vertical and horizontal deflection. The deciding element for efficiency was the fluorescent screen containing of luminous material on the inside front of the glass tube. It had a special colour depending on the application needed, with oscilloscopes it was green where the eyes have maximum sensivity. For television tubes we

needed to produce white colored screens, and the formation of halos by reflections in the glass surface had to be diminished. This optimization demanded in-depth photometric and spectral investigations.



At the Berlin-Lichterfelde institute we sometimes got orders of 100 oscilloscope tubes, and one satisfied customer was R.A. Watson-Watt from Great-Britain. He used our tubes at his laboratory in Slough for precise flash orientation all over Europe with help of three monitoring points on the british border. Later he was pioneering the british radar technology and induced the management at COSSOR to produce british electron beam oscilloscopes. During WW2 he turned to military applications of radar, and later he got knighted for his merits. My personal remembrance on that time of cooperation is tarnished by the fact, that Watson-Watt developed the special panorama radar device used for the exact bombardment localization destroying Dresden and other german cities so cruelly.
During the time of Watson-Watt´s developing efforts the short-wave physician Dr. Hollmann and I devised a very similar panorama radar, which in contrast was intended to help repel air raids. We proposed the device development to the german air force minister Hermann Goering, but he rejected it "because we won the war already"...

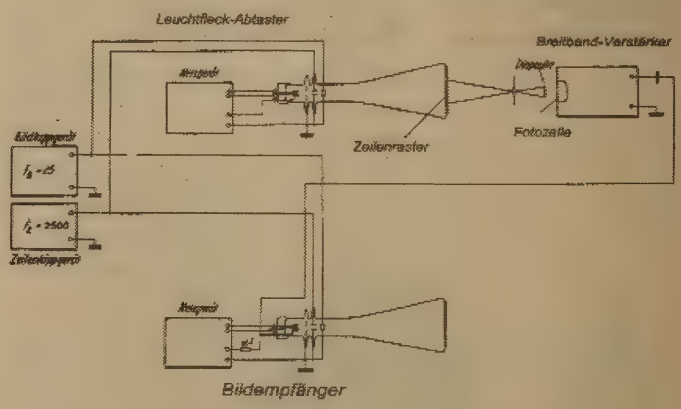


For our sweep oscillators in oscilloscopes as well as for television tests later we had developed simple generators with glow-discharge lamps. The frequency range covered a wide sector from 5 Hertz to several Kilohertz. Synchronization took place by an external control electrode at the special version of glow lamps or by voltage impulses. But we also had complex sweep oscillators with electronic tubes and push-pull power amplifiers in order to give symmetrical sweep oscillations to the deflection electrodes. If you used a vertical sweep with 25 Hz and a second sweep for horizontal deflection with 2500 Hz, you got a raster of 100 lines on the screen of the picture tube.

Broad-band measuring amplifier

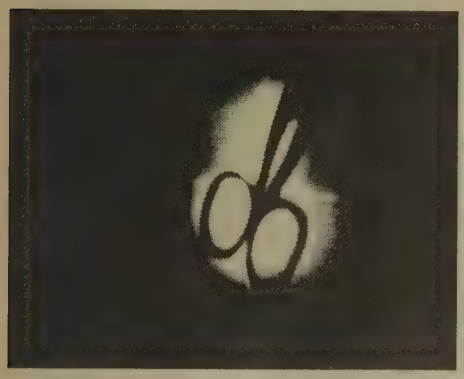
In 1925 I had developed the first broad-band amplifier in electronic history with low capacity construction and very steep electron tubes giving one million Hertz of bandwidth, the "LOEWE" double tube. At the start of our television experiments this device amplified the signal from a photoelectric cell which converted light impulses to video, later the photomultiplier by V.K.Zworykin (RCA) was used. A major problem was the frame scanning at the transmitter side, and i did not want to use mechanical means like the Nipkow disc. On December 13th 1930 I had the idea to employ a "flying spot scanner" as a "simple" solution. This seemed so easy to me, that I never thought of a special publication or even a patent. After a nearly sleepless night I started realization on the early morning of December 14th together with my co-worker Emil Lorenz. The construction of the first flying spot scanner succeeded the same day as we had all needed parts available already in the Berlin-Lichterfelde laboratory.

With the first version using sweep frequencies depicted above the spot speed was about 300 m/s, with present-day television this is more than tenfold. The raster is projected onto the film by very intense optics, and depending on the respective pixel spot translucence more or less light gets to the photoelectric cell behind it and produces a video signal in the broad-band amplifier. The circuit drawing of our flying spot scanner and of the electron beam tube receiver from December 1930 shows the construction`s pure simplicity.



I will always remember the very moment, when the scissors´ contour appeared on the screen of the picture tube in the opposite corner at our laboratory. If the scissors positioned at the film

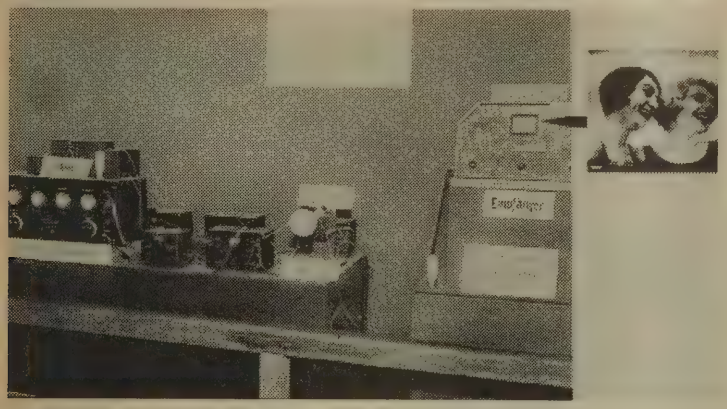
window of the scanner were moved the transferred contour responded immediately - like a miracle. The following days we tried to optimize the video quality, sharpness above all.



Choosing the best sweep frequency for horizontal and vertical beam deflection. Nearly automaticly we ran into the advantages of interlaced scanning which had been developed by Fritz Schroeter (Telefunken) already. At this early stage we used 25 Hz per second frame scanning matching the cinema frame rate. To avoid too heavy flicker the contrast ratio on screen had to be low (today´s computer monitors are using 100 Hz frame rate for instance). So we stayed at around 20 lux illumination in the beginning, although the scanning raster was able to get much brighter.

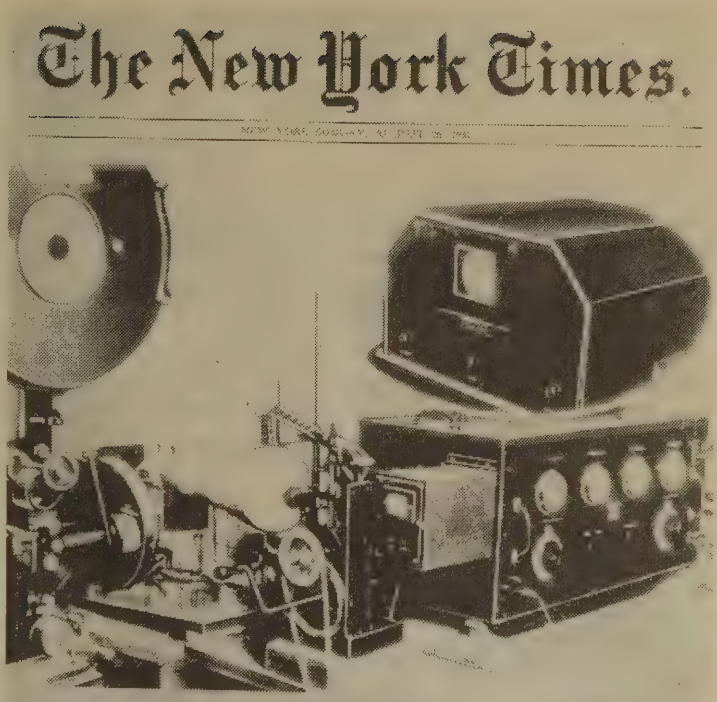
This brightness reserve induced another experiment with a very luminous projection lens producing a big image on a fabric screen. Dr. Gramatzki from Berlin calculated and produced the suitable optics with F1 stop after my suggestion, he also invented the "zoom" optics with variable focal length calling it "rubber lens". Using 5000 Volt DC at the anode electrode we now got impressive projection images up to 1 square meter. This was demonstrated in public at the "Berlin Radio Exposition" in 1931.

World premier of modern television with electron beam



tubes

The demonstration took place at our own exposition stand within the setting of LOEWE. We were the only ones showing such a device. The video quality did not suffice to a public television service yet, but with transition to 180 lines in 1934 it was ready. The leading american newspapers like "New York Times" and "New York Herald Tribune" reported the demonstration of a "Flying Spot Scanner" at the Berlin Radio Exposition, and Walter Bruch (PAL inventor) told me later that this was really a premier of all-electronic TV. We had not worked more eagerly than Zworykin (USA), but he awaited the conclusion of his famous "Iconoscope" camera tube development which took another one and a half year. In contrast our Flying Spot Scanner


The New York Times.

athode radio television station on which Baron von Ardenne of Germa
as been experimenting since 1928. The transmitter and receiver inse
ill be exhibited in a forthcoming Berlin Radio Exposition. The images are se
the end of the tube in the square aperture of the receiver.

The Flying Spot Scanner

only took one day...

Based on contracts with LOEWE being valid until 1932 this company owned all my patents. When Dr. Siegmund Loewe emigrated to the United States in 1933 severe patent disputes with the US TV industry emerged. The pioneer of mechanical TV, J.L. Baird, had heard of our success at the Berlin Radio Exposition 1931 and visited me later on 21st January 1932 in my Berlin-Lichterfelde institute. There he saw bright 100 lines television on an electron beam tube screen for the first time.

ATN-CA Summer BBQ & Meeting

Text by Mike WA6SVT, Email: wa6svt@aol.com
Photos by Mike N6ESW, Email: oracle6@verizon.net

ATN members and guests enjoyed a great BBQ at Don Hill KE6BXT's QTH Saturday August 23rd. Don recently finished landscaping his back yard complete with a granite top BBQ island. ATN provided the meat and members and guests brought a dish to share. No one went home hungry. We also had a tour of Don's shack (it looks much bigger on ATV). We even had our own ATV motorcycle gang show up, Mike, N6ESW, Dave, KA6DPS, Mark, W6MAF, and Norm, KD6OMV, showing up a bit later

The meeting was also televised live via Santiago Peak with a few ATVer's participating there as well. Additional photos by Don, KE6BXT, can be viewed at **http://www.atn-tv.org/pictures/08.23.2008**.

Usually the summer BBQ is just a social event but we did cover a few items for discussion. It was decided to fund a chassis to house a second new ATN controller (Robert, KA4JSR, did a presentation at both the winter ATN-CA meeting and at the ATV forum at Dayton this year).

There was discussion about having a separate office of newsletter editor and at the last minute it was brought out that if it was done by bylaw change it would have to be done at the winter meeting. Several days after the BBQ the position for ATN-CA editor was done by appointment, Mike, N6ESW, is now the ATN-CA chapter editor for weekly news and net announcements. Congratulations Mike!

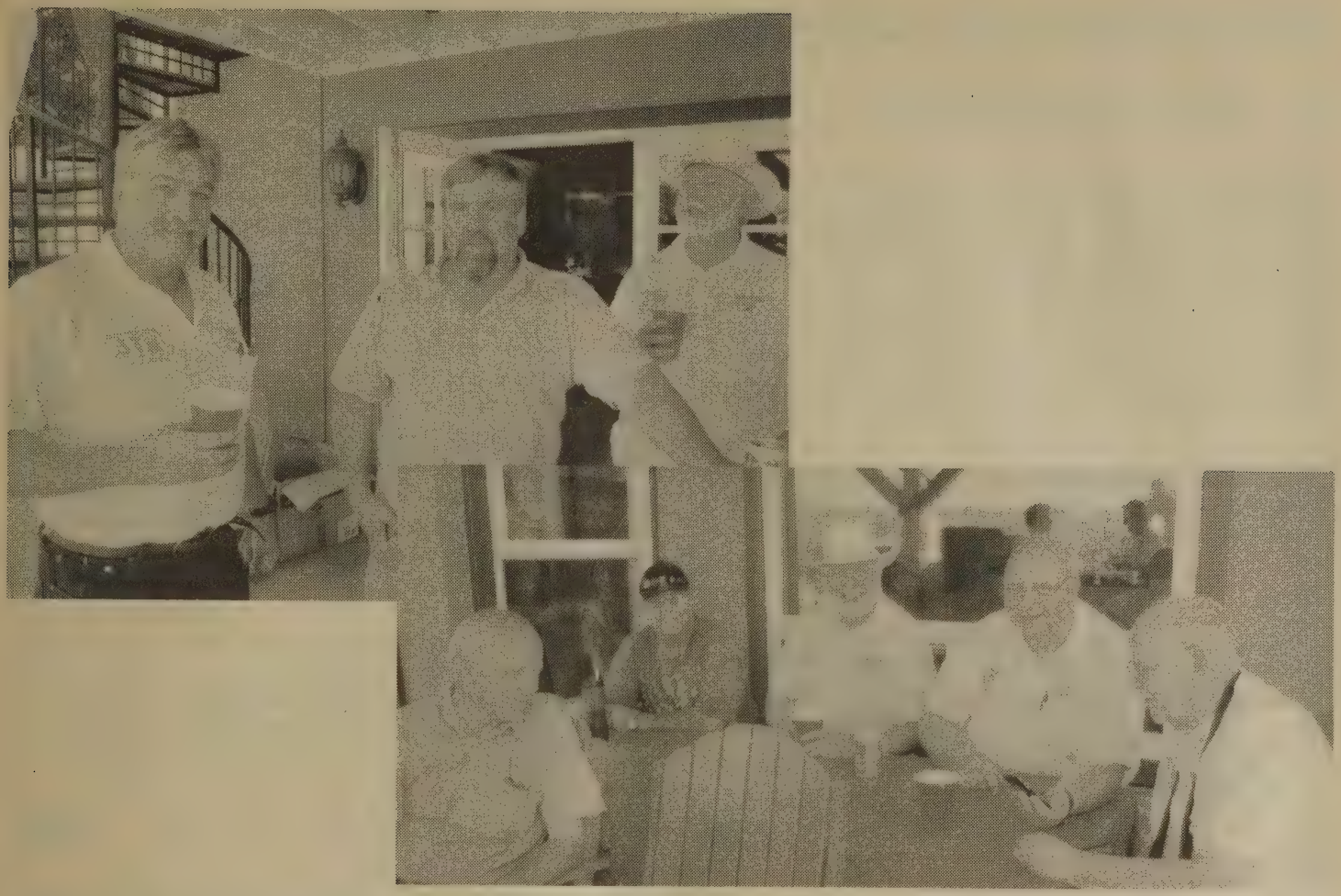
Discussion about streaming ATN video from Santiago Peak and other ATN-CA repeaters via the internet, wide open to anyone to tune in usually via Cam stream. This turned out to be a long topic of discussion. A few felt uncomfortable about their advancement to a world wide celebrity status but would rather like to keep their QSO's more as a small casual group chat.

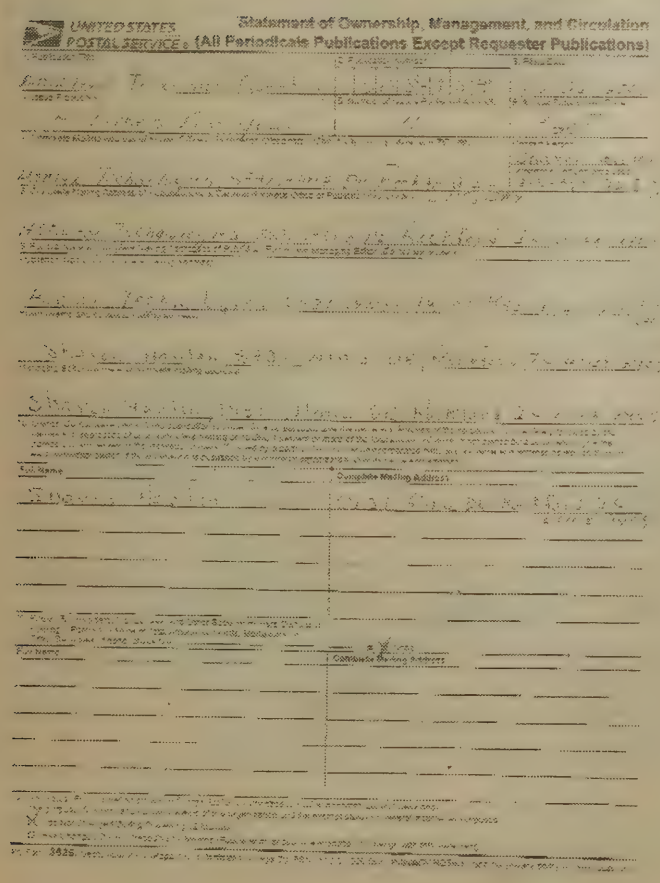
ATVers from outside our RF coverage or in our fringe areas were very much in favor of having the additional tool to view ATV activity. At the ATN website, **www.atn-tv.org** on the home page there is a voting button with this subject and other items to vote on and also comment.

I had to leave early due to work a swing shift that day so I was not able to report on the remainder of the event but really enjoyed the company of good friends, Don's grilling and all the delicious dishes the members prepared. Thank you Don and your wife Cyndi for hosting the BBQ!

ATVQ

George Miglarini, AC6RB, Mike Collis, WA6SVT, Mark Fischer, W6MAF, and Dave Couch, KA6DPS

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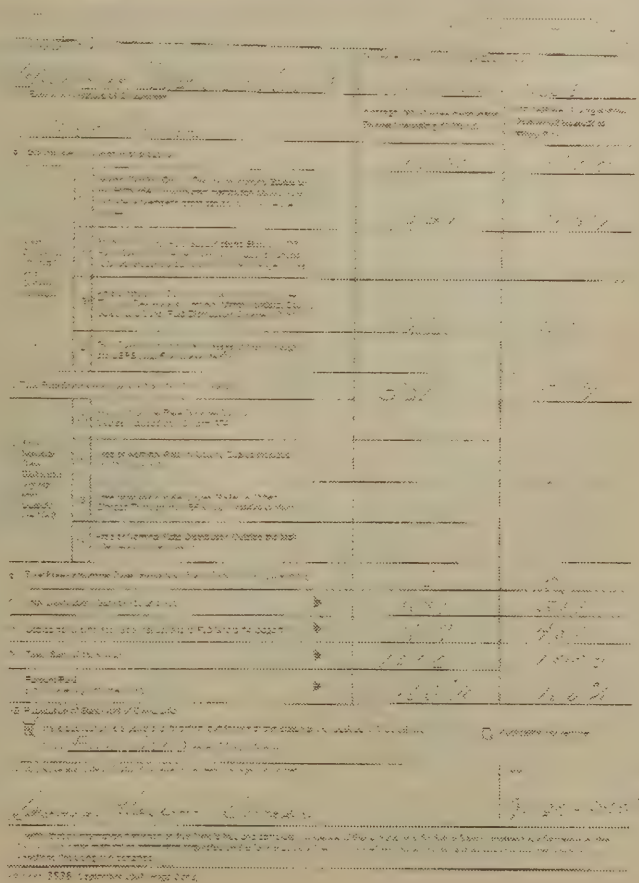

ATVQ TO PAY FOR ARTICLES!

Payment for Technical Articles

ATVQ will pay for certain articles that it publishes. I will outline the policy here, but it will be subject to change as needed to make sure that ATVQ continues to be an ongoing publication. ATVQ will pay $25.00 for technical articles that are published and are a minimum of 2 pages. While this is not a great amount, I hope it will encourage more technical type articles to be written. Exceptions will be articles that are written by a manufacturer/seller of equipment that is being written about. While I do not want to discourage this type of article, the article itself is an advertisement of the product. Articles from clubs will be encouraged, and I would expect they would like to share their information with the ATVQ readership. Information gathered from the Internet will not be paid for and is mostly small filler items.

Ideas

Do you have an idea for an article that you've said to yourself that you wanted to write, but never did. Feel free to check with us to see if it is of interest, or write and send it in. No guarantees that it will get published, but if you don't try, you will never know. I'll be looking to see what you can do!

CONTRIBUTORS GUIDE

Preferred method of receiving articles is from **Microsoft Word**, however **Wordperfect** is OK too. Next preference would be **ASKII text**, followed by **typewritten** or **hand written** (clearly). Diagrams or pictures (B&W or Color) can be sent in hard copy, or if you scan them in, save to PCX or JPG formats (actually I can read about anything). If you send a computer disk, make sure it is PC (not MAC) format.

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Articles can be sent to:
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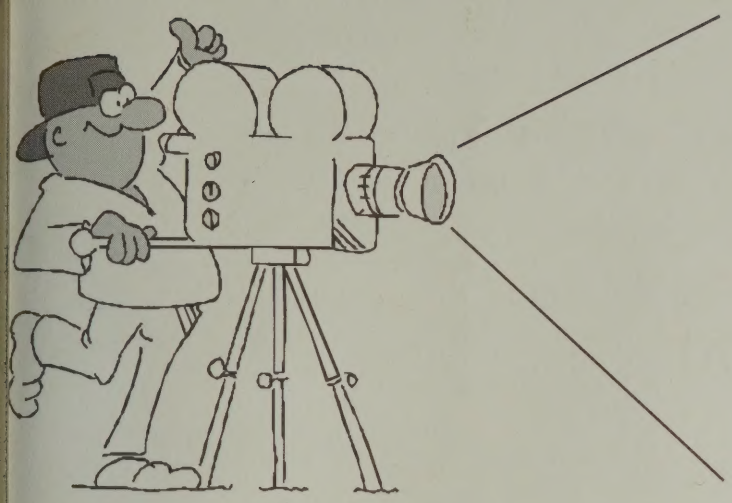

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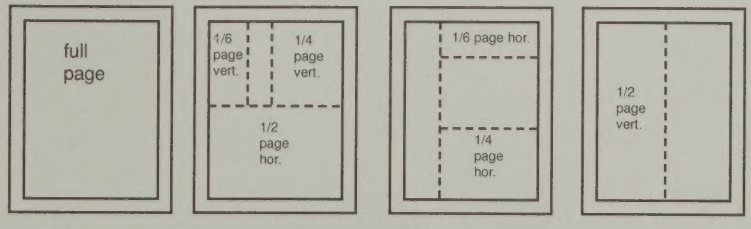

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